

# atomic

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## EXCLUSIVE REVIEW: RADEON 9700 300% faster than GeForce4 Ti4600



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NVIDIA NFORCE2 One sexy mother of a board

THE GOLDEN RAM DDR vs. QBM vs. RDRAM

VACUUM TUBE MOBO Shine on you crazy diode

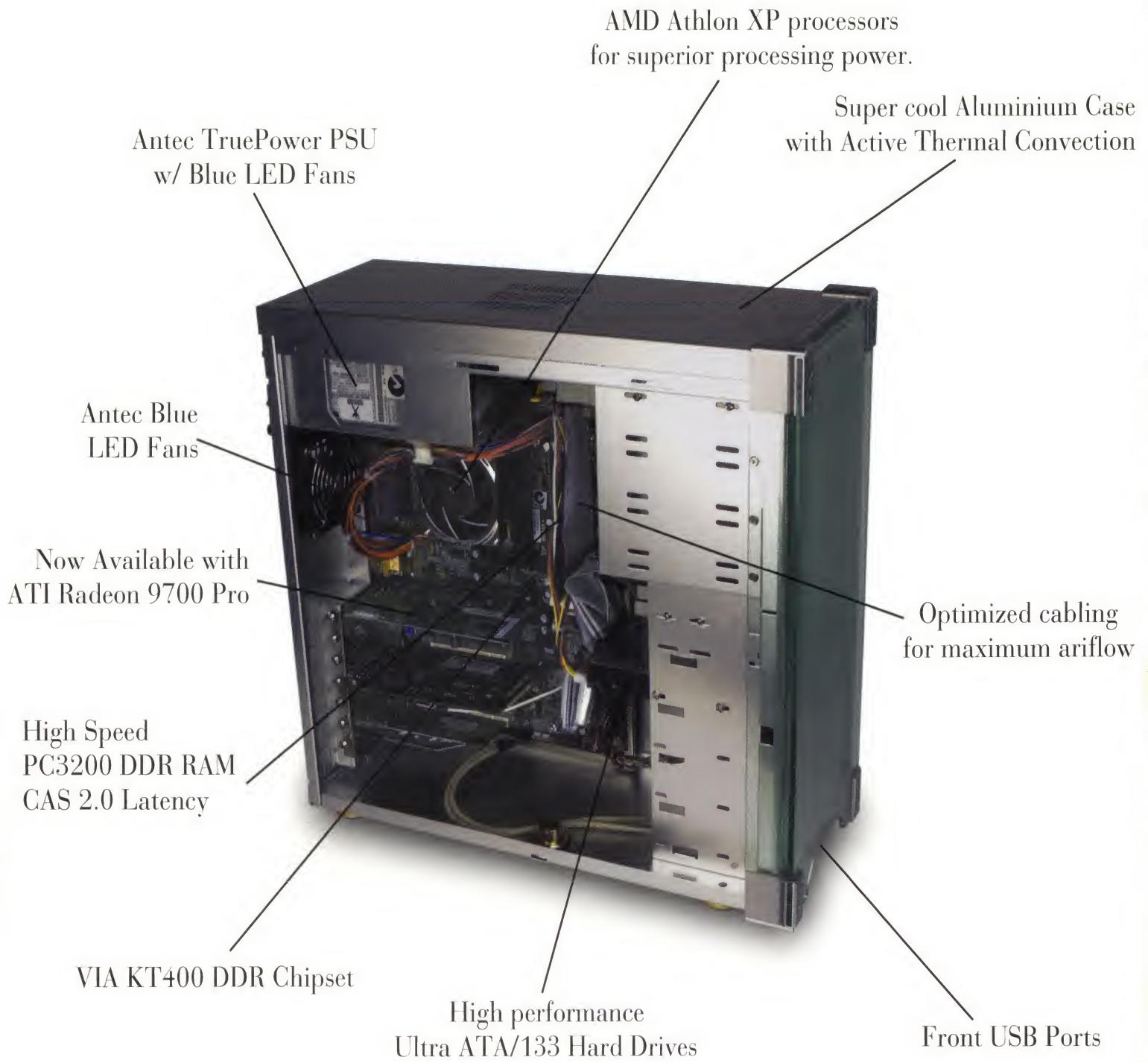
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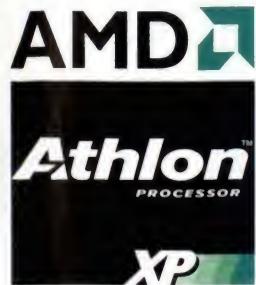
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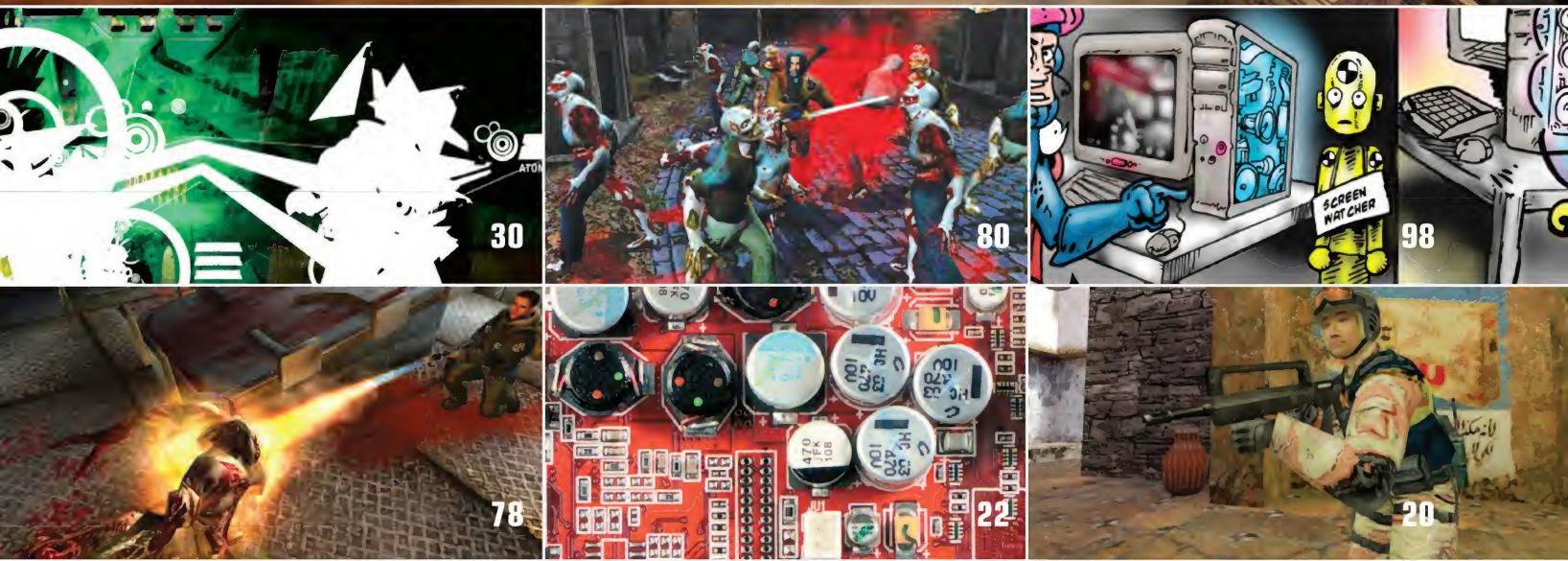


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Could LANning become to the 2000s what the rave scene was to the 1990s? If so, we can only hope that pretentious prats, whistles and lollipops stay the hell out of our gaming LANs.

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30

You thought memory was all about the past, but the sweetest memory is yet to come. And RAMBUS still sucks. Will the future bring another DDR-level leap forward?

## FEATURE: The fastest video card ever

22

We've got the Australian scoop on the hottest video card on the block – Gigabyte's new RADEON 9700 aka ATI R300. Chock full of techie info and benchmarks, we show you just how slow a GeForce4 Ti4600 can look.

## FEATURE: P4 overclocking deathmatch

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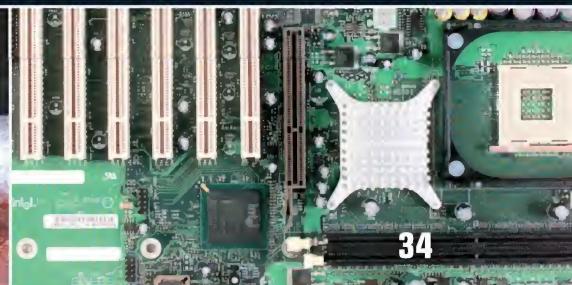
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The light at the end of the BSOD tunnel.

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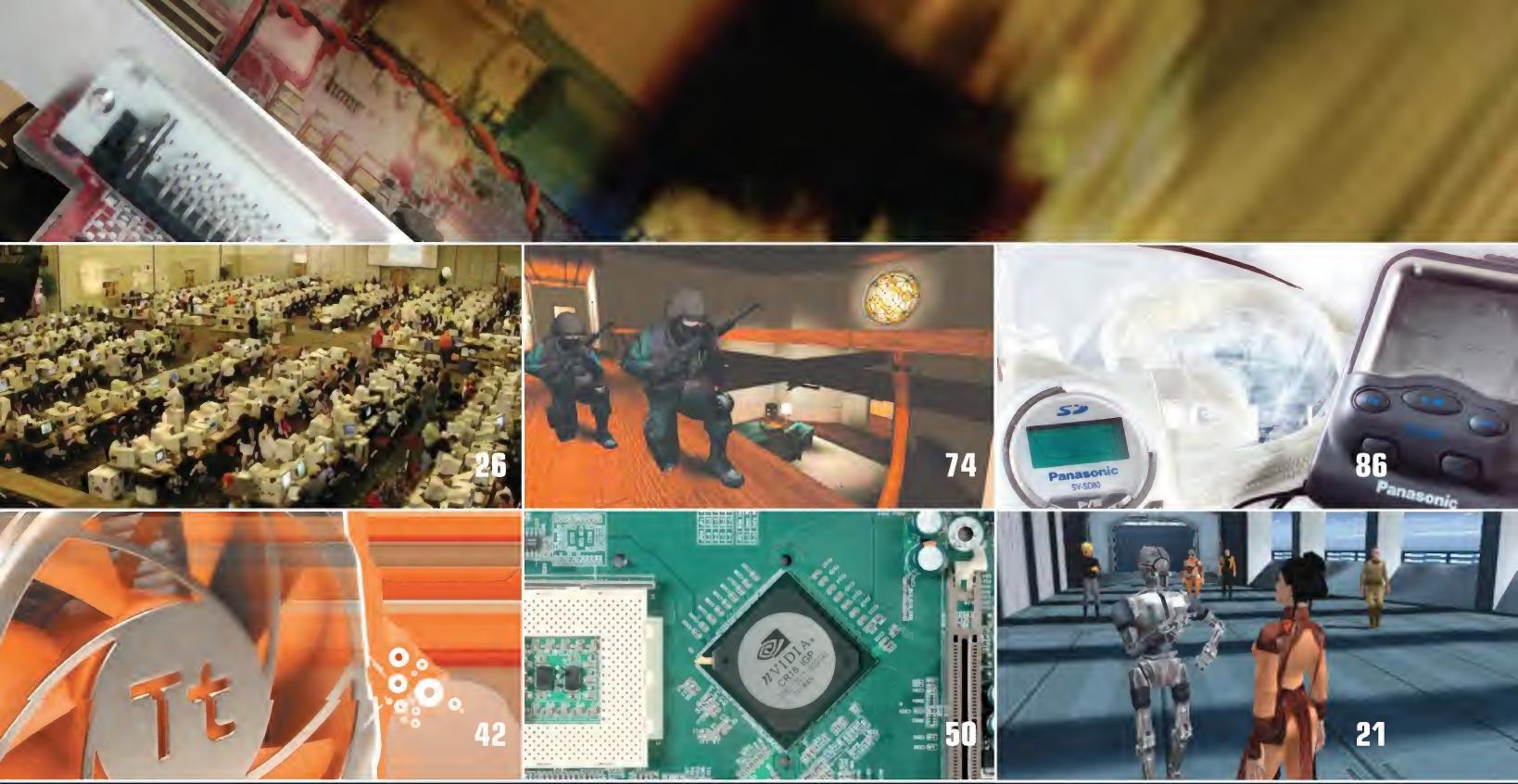
It's time to get your Linux box online in the next part of our Linux project. We've even got a free firewall script to help keep the bad guys away.



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Save money, save time, save yourself a ponderous walk to the newsagent each month. You know you want it. We know you want it. So just do it. You might even win yourself a top-shelf Panasonic e.wear SV-SD80 MP3 player in the process.

## COMPETITIONS

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If you don't want to win lots of expensive booty for absolutely no cost, then don't look here. 'Sif. Score a RADEON 9000 this month, as well as other choice booty.

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If a thousand monkeys bashed on a thousand keyboards for a thousand years, you'd have nothing like the letters here.

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# Tubular belle

The glimmering primordial dawn of the Information Age began when Thomas Edison invented the incandescent light bulb in 1879. A little later John Ambrose Fleming added a second element, named the modified device the *diode* and turned what was originally a mere illuminator into something that miraculously converted radio waves into electricity. In 1906, Lee de Forest added a third element, sensibly naming it the *triode*, and told the world about how it could be used both as an amplifier and a switch. Edison wanted to light up our lives, which he did. And how.

Over the next few decades the *triode* – or as it became more commonly known: the *vacuum tube* – opened up a world of possibilities. Without the vacuum tube, there would have been no computers. Well, no computers right when we really needed them, calculating ballistic trajectories and unscrambling the Nazis' enigma-coded messages.

The first computers were behemoths. Remington Rand's mighty UNIVAC used around 5,000 vacuum tubes. Eckert and Mauchly's ENIAC used over 19,000 tubes, and

consumed a staggering 200 kilowatts of power to run – it caused brownouts in Philadelphia when it was turned on. The heat generated was phenomenal, and required advances in air conditioning engineering to keep pace with those of computing.

Computers are sexy and to many, like you and us, even lovable. None have ever been more lovable than those old original tube babies, but that era couldn't last. Tubes took too long to warm up, the odds of having at least a few blow at a critical point in a calculation run were unacceptably high.

The warm glow of the glass tube began to dim in 1948, when Bell Labs invented the transistor. It took a few years to make them reliable enough for computers, and it wasn't until 1954 that the first tubeless computer was built. TRADIC (TRAnsistorized Digital Computer) powered up in an instant, was orders of magnitude more reliable than any tube computer; and best of all, it needed only 100 watts of juice to tick over.

The transition to a world of tubeless computers was a slow but inevitable one. While the evolution towards transistor-



based computing slowly lumbered forward, a Japanese company; Tokyo Tsushin Kogyo KK, bought from Bell a license to build transistors. While the Americans focused on slowly improving computing, mainly for military applications, this Japanese company instead created something very different: a mass consumer pocket radio. It was one of the most successful and impactful products ever created. Suddenly people all over the world had instant, portable access to information. News was heard as it happened. The developing information age had suddenly accelerated from walking pace to warp speed. Tokyo Tsushin Kogyo KK changed its name to Sony, the transistor was the hero of a social revolution and the vacuum tube overnight became the symbol of an ancient age of mad professors and their funny-looking punch cards.

The TRADIC computer had 800 transistors. The core of a RADEON 9700 has 100,000,000. The RADEON symbolises nicely what we at *Atomic* love about computers. It, in itself, stands atop the Mt Olympus of electronic engineering and design. Its function is to generate believable worlds to escape to. It is nicely representative of the sci-fi state of computing power and blinding pace of its development. Yet there is a coldness about it, stemming from its incomprehensible complexity and impossible-to-imagine physical composition.

So what are we to make of AOpen's Tube motherboard? While the tube is there for audio, not processing, the longer I stare at the motherboard – beautiful as it is in black and gold – it is the warm glowing tube with its astonishingly huge capacitors that makes me love this strange thing. As audiophiles know, tube amps produce a much more enjoyable sound, and indeed the Tube motherboard does sound wonderful, but that's not why I'm rapt.

The happiness that comes with seeing a tube – computing's equivalent of the first footprint on the Moon – standing proud amidst the tremendous technology it gave birth to is special. With a raised eyebrow the Tube motherboard is amusing in many ways: there is an inescapable sense of irony, and the innovative design is kooky brilliance, but without any doubt this is just a beautiful thing.

We're conditioned to look forwards to what a computer can be and what it will do for us. It's nice for once to look back at what they were. Nicer still to see the oldest and the newest together, providing, literally, the best of both worlds.

Ben Mansill

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## Short Circuits

**Telstra likes making money for shareholders. Australia's largest Telecoms company has decided it needs to cut spending to make it the leanest, meanest Telecommunication company in the world. Leave aside the obvious joke and rejoice in the fact that Linux is one of the systems being considered for deployment to around 45,000 Telstra desktops.**

This could mean one of two things. Firstly, Telstra may be serious in its evaluation of Linux. We don't need to point out the advantages of having 45,000 more people learn the operating system and discover its advantages over competing OSes. The other possibility here is that Telstra is using the threat of a Linux deployment to solicit lower licensing fees from other IT vendors currently bidding for Telstra contracts. Fingers crossed that this is not the case.

**What do you do when you're worried sick for your 15 year old daughter, who's still out and about partying at 4am on a Saturday morning? Do you give her Mobile a ring? Do you go out driving in an attempt to find her? Do you go to bed, trusting her judgement and knowing she'll be ok? Or do you just jump on the Net and find her current position on a map down to less than a metre, all within 60 seconds.**

A new tracking product aimed at parents of young children has just been released to the US market which offers exactly this capability. Basically a brightly coloured watch with GPS built-in, the device allows parents to track their children 24 hours a day both via phone and the Internet.

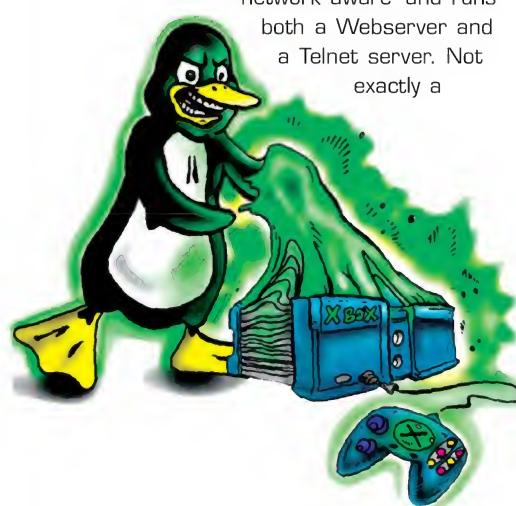
The device retails for a tad under \$US400, with an ongoing monthly fee to boot. Currently limited to the US, a GSM version is under development for sale in other countries.

## Tux assimilates the LinuXbox

Break out the Bollinger, lock down the valuables and get ready to party – Linux is now on Xbox! After much effort on the part of developers across the globe, a major milestone was finally reached late August when developers for the Xbox-Linux Project announced successfully booting Linux on Microsoft's Xbox console.

Now we're not just talking booting a kernel and a tiny shell here – on no. The Xbox-Linux distribution, as it currently stands, boots

'network aware' and runs both a Webserver and a Telnet server. Not exactly a



fully-fledged operating system, to be sure, but still a very good start towards that goal.

Xbox-Linux is currently available as both a ROM image and on bootable CD. Unfortunately you still need to have a mod-chip installed in the console before you can run Linux, thanks to the Xbox 'feature' of not being able to run unsigned code (due to recent work by the ACCC, Xbox mod-chips may actually be legal here in Australia. Fingers crossed!).

Courtesy of the wonders of Free Software and the GPL, those of you who feel the need to tinker can do so easily, using the Xbox-Linux source code available from the project's SourceForge Website. Also keep in mind that the project is, as always, looking for more people willing to contribute in some way.

At time of writing, developers have released patches to enable both sound and USB Xbox hardware. Plans are afoot to eventually support all Xbox hardware in full.

If you're the type to muck around with expensive hardware for no good reason (in other words, a True Atomican), and you've bent to see Linux running on Microsoft proprietary hardware, check out the Xbox-Linux project on SourceForge at <http://xbox-linux.sourceforge.net>.

## Was it something we said?

We had a bit of a surprise in store for you all this month. Coverage of Sydney's Information Security World (ISW) conference, a gathering touted by organiser Terrapinn Australia as 'must-attend'. Unfortunately we can't tell you much about the workshop we attended, as we had to leave barely one hour into it.

After arriving at the venue ten minutes early, we proceeded to a room hosting the Intrusion Detection System (IDS) workshop.

Noticing our presence at the back of the room a few minutes later, the speaker asked if we were part of the group. We displayed our media pass and the workshop proceeded smoothly to mid-morning break.

Barely five minutes after workshop recommencement, a question was posed concerning Intrusion Detection Systems and implementation

in the real world.

In answer, an official from the Taxation Office stated that he would not be comfortable answering questions with a member of the media in the room. Having been granted special exemption to attend what was normally a 'no media' event, *Atomic* was the media rep he was referring to. We wouldn't say that the Tax Office representative's comment had the same effect as the announcement of opening hostilities in World War 3, but judging by the amount of shocked or discomfited expressions around the room, it was very close to that effect.

One has to ask why the Tax Office was fearful of answering questions and giving opinions on network security? The workshop was a public forum after all. With payment being the only requirement for attendance,

one has to wonder if the Tax Office would have had the same objections had media paid to attend as delegates rather than obtaining media passes. Unfortunately however, some companies and Government organisations seem to have a natural aversion to any sort of commentary when media reps are about. A pity really, especially when you consider anyone straight off the street, including 'hackers', could attend by simply registering and paying a fee.

After the Tax Office attendee's comment, *Atomic* decided it was better to leave of our own volition – and before we were formally asked to. Which means that here must end our coverage of Information Security World. Keep reading – hopefully next month, we will tell you all about how we got ourselves kicked out of DefCon.

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## Short Circuits

Microsoft plans to publish details of an additional 272 APIs and 113 Windows protocols over the next few months in an effort to appease the US Department of Justice.

Access to the APIs will be free. However, Microsoft will charge a fee for access to each protocol, dependent on the cost of Microsoft products using each API protocol.

At least one protocol and API have been taken off the release list after Microsoft cited potential security issues with their publication.

Rejoice, for after months of hearing about 'broadband over powerline' trials in other parts of the globe, trials are finally coming to Australia!

Essentially, the NSW Government is looking at ways of connecting people to Government-owned fibre networks via the state electricity grid. Called New England Smart Communities Action Project, the pilot program has involvement from several major organisations including the University of New South Wales, AARNet and Country Energy. If successful, the \$100,000 program could pave the way for wide-scale deployment of the technology across the state and, hopefully, the country.

Vin Diesel plays D&D. Yep, that's right – he's just as much a Dungeons and Dragons freak as the rest of us. Kind of warms the heart really.

According to entertainment news site FilmForce, The Vin has been playing D&D since the age of twelve when a friend's mother introduced him to the game. While in a US D&D store recently, Diesel purchased over AU\$1400 worth of D&D accessories – allegedly as 'research' for an upcoming 'secret project'. Perhaps *Pitch Black* with Orcs?

## Copy rights and wrongs

Copyright violation is illegal. It's also wrong, from a purely moral point of view. Fine, most people would agree with that. Most people would probably also agree that certain steps should be taken to make copyright violation harder. However, the actual methods used to carry this out (or attempt to do so) generate wildly varied commentary from both pro-Intellectual Property (IP) holders and Consumer Rights advocates.

The latest step in the battle to curb copyright violation has come from an organisation many now see as one of the world's biggest threats to freedom and consumer rights in the online world – the Recording Industry Association of America.

In an action late August that generated reactions ranging from shock and disbelief through to anger and threats, the Recording Industry Association of America sued major American backbone providers, including AT&T Broadband, Cable and Wireless, Sprint and UUNet, for providing network access to a Website that allowed users to violate copyright by downloading MP3s.

Called Listen4ever.com, the Chinese-hosted site had previously been asked to shut down of its own volition by RIAA representatives. When this failed to materialise, the RIAA promptly sued the abovementioned companies, citing their 'unique position' to block access to listen4ever.com.

While this could be interpreted as yet another foolhardy action on the part of

overzealous IP holders, there were major implications had the RIAA won its case. Not only could it potentially have given the Recording Industry Association of America power to effectively block Americans from accessing online content it didn't agree with, it would have also set a precedent to be used by other IP holders.

The online community's outlook was generally positive. Despite being shocked at the RIAA's audacity, most were confident that the Association had finally picked the wrong companies to bully. After all, it was suing the four largest names in Telecommunications in the continental United States. As cases such as these relied largely on the amount of money each side could afford to throw at lawyers, most saw the RIAA's fate as that of being smacked black and blue by the endless pockets of the Telecoms industry. The RIAA dropped its lawsuit a bare five days after initially filing. The official position was that the Website had closed, and so there was no longer a need to restrict access to it. However, the fact remains that the RIAA was willing to sue major network providers in order to have overseas-hosted content blocked from access within the United States.

If a similar situation occurs in future and the IP holder wins its case, more people than just those located in the home country will be affected. Sadly, a win for IP holders in a case such as this would have every IP holder on the planet considering use of the same tactics.

## Atomican

ChaosLady, along with Ashton Mills, created the now internationally consumed AtomicShots™. *Atomic m337s* would be considerably less unruly if it weren't for this drink. Without Chaos, the Australian bum-pinching quota would never be filled, and Viggo Mortensen (Aragorn) would be less paranoid about the security of his sweaty self.

**The Great Atomic Story** ([www.atomicmpc.com.au/forum.php?cat=ge&top=56734](http://www.atomicmpc.com.au/forum.php?cat=ge&top=56734)) is definitely a whopper of a thread. It has absolutely everything the discerning Atomican reader could want: danger, sex, peril, tragedy, and... more peril. If there were any recurring themes within the story, they would be that Captain Atomic can get himself out of any situation, neophyte wants to go out with a chick that works at Subway, while the rest mostly peril.

**In the Community Events section of the forums** ([www.atomicmpc.com.au/forum.php?cat=co](http://www.atomicmpc.com.au/forum.php?cat=co)) lots of events are organised with other Atomicans and we all have great fun getting out and terrorising society. Take for example the recent OCAU vs. *Atomic* meet. The event was a great success, and a good time was had by all. Personally, I'm going to try to organise a m337 to go and check out the *Star Wars: The Magic of the Myth* exhibition that has just opened at the Powerhouse in Sydney. In closing, my advice for the month is for all Atomican parents out there. No matter how much your four year old child whinges and nags you, I'd suggest never, ever buying them a Toyota Forklift.

Wilshake

### WHAT'S HOT

- THE THING – Fear the evil Norwegians
- RADEON 9700 – ATI's second coming
- DDR333 – Newfound performance and stability
- VACUUM TUBES – The good kind of warmth
- ANTHONY MUNDINE – Newfound credibility

### WHAT'S NOT

- IT – What's so scary about clowns anyway?
- GEFORCE4 TI – Finally it sucks
- DDR400 – Hail the flaky pseudo-standard
- VACUUM CLEANERS – White noise isn't fun
- THE BULLDOGS – More dollars than sense

# Designed for eXtreme Performance

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non-Overheating protection



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- ASUS POST Reporter<sup>a</sup>, ASUS MyLogo<sup>a</sup>
- Smart Card/Memory Stick/Secure Digital (Optional)
- 4 x USB2.0, 4 x USB1.1, 1 x IEEE 1394 (Optional)
- ATX Form Factor



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(CPU Overheating Protection)



ASUS Q-FAN<sup>a</sup>



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# The fallacy of fair use

Ashton Mills treasures the liberties he enjoys for the products and works he owns while he can, because how he uses them may soon not be up to him.



Maybe I'm just a completely naive bastard but I happen to think it's possible to protect the rights of authors in relation to the content they create and how it is used, and not shaft consumers for the sake of a few extra bucks in the process.

It seems that every month a new 'initiative' hits the market that is all about the politics of control and individual liberties are tossed to the wind. The most recent announcement is Sony's new OpenMG X DRM (Digital Rights Management) 'technology' which aims to provide control from the distributor all the way to the consumer, right into your home,

## '...every month a new "initiative" hits the market that is all about the politics of control and individual liberties are tossed to the wind.'

right inside the devices you use from the PC to portable players. One of the key 'features' of OpenMG X, apart from limiting usage and playback, is its ability to report back to the copyright holder the number of times a piece of music or video has been used and/or copied.

Sorry? Did the concepts of privacy and fair use sneak out the window when I wasn't looking?

Did I give you, Sony, permission to monitor and report my usage statistics – which are, inherently, my property – to a third party? Did I give you permission to use the bandwidth I've paid for on my Internet connection to do this? I've lost all respect for Sony.

It sickens me how companies will do anything for a buck, and shaft people for the bottom line. The RIAA and MPAA jumps up and down and blows out of proportion the effect the Net is having on sales (numerous reports confirm MP3s do in fact increase CD sales, and the film industry is booming), demanding a mechanism by which they will have

even more control over distribution than they currently do, and companies like Sony and Microsoft are all too happy to step up to the plate with a technology to sell.

The RIAA especially is trying to swing a buck at every single step of the way – Webcasting royalties are now so high that many Internet radio stations are going bust, if they haven't already, and the RIAA's latest initiative involves trying to claim royalties from *used CD sales*.

If DRM mechanisms such as OpenMG X become the norm, I think I'll be adding a new rule or two to my firewall (*see page 88*) to *keep information in*. Oh, wait, this might

be 'circumventing a copyright protection device' under the DMCA, in which case you'll have to send me to jail for protecting my rights (such as the right to privacy, just for starters). What a tangled web the US has woven. But rest assured it will happen here too. Europe is currently finalising its own DMCA and Australia will have to follow to keep content distributors happy. And if our Internet Censorship law is anything to go by, you can bet it's going to be as equally stupid as the Yanks' misdirected intentions.

Copyright was invented to protect the rights an author inherently has to their own work, as well as serve the best interests of the public.

Today copyright law has been amended numerous times and perverted into a legal club the middleman uses to reap income – creative authors and public interest be damned.

Right now it's fair use to copy music to another format, such as MP3 or tape. It's fair use to tape a TV program. It's fair use to copy

software you own for backup purposes. But fair use is *not* an established right, rather an exception to copyright law – when DRM devices appear and spread into the mainstream, no liberties will legally be erased because they were merely unsupported exceptions in the first place.

I'm sorry, but what I buy is mine to use how I wish.

If I buy a CD and I want to MP3 it, I will. If I want to make a copy to tape for the car, I will. If you pump TV into my lounge room, the signals now cycle in *my hardware* and I will preserve them if I wish. And you can jump up and down and throw legal papers in my face, and I will tell you that you have no authority over the products I own – not over the bits and bytes in my TV or burned into a physical CD *that is my property* – and I will use them how I see fit, and respect the author of the work.

And if you tell me this choice is no longer mine to make, that the distributor now has control of this choice through hardware devices or software formats, then I will never buy them.

I will not buy anything that restricts my freedoms, restricts my choices, or takes away the right for me to use my property how I want to use it. I will not accept being treated as guilty-until-proven-innocent by such draconian mechanisms.

And you should do the same. When DRM comes, boycott it. Don't buy DRM-protected CDs or music from the Web. Don't buy DRM-protected portable players, CD or DVD players, or Palladium- and OpenMG X-equipped PCs. Don't buy DRM-enabled TV and HDTV devices. Remember: this sickening self-serving crap has come about because of money. If DRM products don't sell, they'll disappear. Spread the word to the other 90% of the population who has little idea of what is coming. Vote with your wallets. It's the only language monopolies understand.



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# Bug out

When will computer game developers wake up and smell the stagnant quagmire? Tim Dean wonders where all the pioneers have gone.



Every now and then, you come across something that makes you take pause in your life, sit back, and ponder. Something that surreptitiously shatters the shell of preconceptions you build around your world. Something that really makes you think.

I remember once, when I was about 17, I was lying in bed reading a book. Now, when you're 17 (for me, at least), I was getting to the point where I felt I was starting to get a fairly good grip on this 'life' thing. I'd been around a bit. I'd seen a few things. I dug stuff. And especially when it came to my immediate environment, I was fairly comfortable I was in control.

This wasn't like when I was, say, seven

radar and not be noticed until now?

What's more – I started noticing these bugs more often. They seemed to like books. I saw them sitting on other books in my room, in the living room and even at the local library.

So, here was a bug, an apparently common bug, which was all over the shop, yet a bug that I had somehow failed to notice throughout my life up to that point. Far out.

At that point, I learned a valuable lesson. No matter how much you know, or think you know, the real world is far bigger than your mere perceptual world, and it will continue to hoodwink you every chance it gets. As such, holding on to your preconceptions about the way stuff

Black and White came close to really changing things with its advanced AI and unconventional gameplay, although at the end of the day it didn't quite follow through with its ideals to make a massive impact.

Everything else in the last couple of years has been very much same-old, same-old. Things have evolved slightly perhaps: game engines have gotten more advanced (such as with Doom 3), more functionality has been incorporated (such as with the complexities in Tribes 2) and games have gained in terms of depth (such as with Morrowind) – but there is little that is really exploring the potential of what games could be.

And I don't think it's really that hard. For example: what about a game with two game engines? Something like a *Star Wars* bounty hunter or smuggler type game, where you fly around space using a space sim engine (like X-Wing Alliance) making your delivery or chasing your prey, and then load into a first-person engine to continue the action on the surface (like Jedi Knight II), along with role-playing elements (like Deus Ex)?

Or what about a massively organised online game, such as was attempted unsuccessfully and unofficially with the WWII Combat Mission Meta Campaign a couple of years ago – where a group of players roleplayed the strategic aspects of the war, and resolved the tactical battles in-game?

Or what about a variation on the two-engine game with something like a Robotech/Macross simulator, where you can fly around and dogfight in the air, and then seamlessly transform into a ground-based battloid fighting on foot in a cityscape (and not just like in the upcoming Robotech Battlecry console game – but a fully-fledged simulator)?

I think there is a great deal of unrealized potential in PC gaming, and it will remain unrealized until the developers, and more importantly, the ever-conservative publishers, break free from convention, and really begin to explore the possibilities – all in the name of gameplay.

Maybe they all need a bug up them. That'd learn 'em. . .

## 'denying the inevitable is like mowing the lawn with a bucket of fish – it might seem fun at first, but it just doesn't make any sense.'

years old. Back then every turn I made in life, whether it be going to a restaurant, for a drive in the country, or just turning a corner, was filled with wonder. It was filled with new stuff. Stuff I had never experienced before. Stuff that was exciting. I lived in a world that completely surpassed my understanding, and as such, I had no expectations of the way it should be – no preconceptions.

When I was 17, however, the daily world had lost a lot of its baffling aspect. I knew what to expect from my environment, whether it be at a restaurant or a drive in the country, and I knew what was around the corner. It was all starting to make sense.

Then it happened. As I lay there, reading my book in bed, I saw this little bug walk across the page. Now, the bug itself was not that startling: it was small (about a millimetre long), black, and kind of round. A fairly nondescript bug, by all accounts.

The thing was, I had never seen this kind of bug before. And that really threw me. I was 17! I knew stuff! This was my room! How could it be that some bug can just slip itself under 17 years' worth of

is can be dangerous. You must be continually prepared to dispense with your current worldview in favour of a better one. Holding on to your old one in the face of overwhelming evidence is a sign of a closed, ignorant mind, and while that might be a narrowly-comfortable state to be in, you'll never really get anywhere like that. Change can be scary, especially when it concerns your beliefs about the world, but denying the inevitable is like mowing the lawn with a bucket of fish – it might seem fun at first, but it just doesn't make any sense.

Which brings me to the point of this column: when are game developers going to wake up and realise that the world is far, far bigger than they are allowing themselves to think?

In my estimation, the only really pioneering work in games development since the advent of massively multiplayer has been Neverwinter Nights.

At least Bioware had the mojo to step outside the square of gaming preconceptions and really think about what was around in terms of technology, what it was that people wanted, and what it could do with it all.



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# Do you have a license for that Athlon?

If you can't double-declutch at the command line then you're in Daniel Rutter's way.

One of the axioms of information technology is that most computer users' PC-wrangling abilities suck. Seriously. They suck raw eggs. Through a very thin straw.

Tech folklore has immortalised the cup-holder story, the foot-pedal story, and the I-can't-see-whether-my-computer's-power-cable-is-plugged-in-to-the-wall-because-this-blackout's-killed-the-lights story.

After recounting a few more recent additions to the canon of Bitter Tech Support Person Humour, the Bitter Tech Support Person with whom you've for some reason decided to have a few drinks is fairly likely to advance the idea that some sort of compulsory

CPU cooler on backwards. Or else they'll... they'll... they'll be flogged! Thassright. Barkeep! More Absinthe!

Since graphical-interface operating systems first appeared, there've been old-school gurus grumbling that you shouldn't be allowed to use any computer – personal or otherwise – unless you can handle a command line. And that you shouldn't be allowed to use a *good* computer unless you can write Towers of Hanoi in the shell of your choice. Which had better be the same shell as the guru uses. Or else.

Some of the people who advocate computer licenses may actually mean it, but most of them are exaggerating for comic effect. What they really want

**'...people who don't have a computer license should be allowed to use some analogously less powerful computing device, like a WebTV.'**

qualification system should be put in place to stop this sort of unnecessary thing from happening.

Computer licenses, in other words. Clueless computer users *can* cause harm to people besides themselves, after all, by accidentally running open mail relays and unpatched IIS servers and such. Or just by driving Bitter Tech Support Persons past the point where coming to work with a faraway look, and a really heavy gym bag that clangs ominously, starts to look like a marvellous idea.

Computer use should be a privilege, not a right. Like driving. You can ride a bike without a license, so people who don't have a computer license should be allowed to use some analogously less powerful kind of computing device, like a WebTV. But if they want to be allowed to assemble and use and upgrade a real, general purpose computer, then they'll have to demonstrate that they know not to put motherboard standoffs in places where there aren't motherboard holes, and not to send HTML email created by Microsoft Word, and not to put their

is for people to realise that computers are still difficult to use.

That's right, J. Random Compaq Owner, the salesperson *didn't* say that. Go and shout at the salesperson who *should* have, if it makes you feel better. Because computers, and PCs in particular, *are* still difficult to use.

If you're a user who hasn't come to terms with this fact, please do. You'll take a great weight off the shoulders of the people you bother with your irrelevant PC problems.

In the early days of the automobile, the car-operating experience was not an easy one. You couldn't just press this pedal for faster, and that one for slower, and turn the wheel in the direction you wanted the machine to go. You had to do things like double-declutching – releasing and re-engaging the clutch not once but twice when changing gear, because your jalopy's non-synchromesh gearbox had to have neutral properly *engaged* before you could get it into another gear.

These days, double-declutching is for truck drivers and rally racers and show-offs. Today's computing irritations

will, most likely, similarly be the domain of industrial and very specialised computing only, in a decade or three.

Things are better than they were. Much better.

I haven't had to wrestle with an IRQ conflict for ages. Both Windows and Mac users who've upgraded to the current OS versions no longer have to reboot all the danged time when their computers crash. Built-in automatic OS features that can do things that separate apps also do are now actually sometimes useful. USB and FireWire more or less work, and they beat the pants off parallel and RS-232 and the eldritch rituals that often attended SCSI device compatibility inducement.

But, generally, we're still at the stage where you have to know how to double-declutch. You might not like the fact that you have to know that, and you may wish that you didn't have to know that, but that's just tough. You still have to know.

People shouldn't *have* to learn lots of abstruse stuff just to be able to write a letter, of course. In the analog world, the pen-and-paper letter writing system is a pretty intuitive one.

But PCs let you write letters and paint pictures and edit video and recreationally shoot people who live on the other side of the world.

It's not entirely surprising that such gigantically complex general purpose information processing devices, selling for well under 10% of the average annual wage, are just a tad tricky to get to grips with.

There's a part of me that finds the idea of brutally enforced computer licenses highly appealing. Pocket-protected compliance squads kicking down the doors of people who tried to get a warranty replacement on a video card that they pushed into the slot while the computer was on.

That works for me.

In the real world, though, all we need is for new computer owners to have a more accurate idea of what they're getting themselves into.

So first, let's lock up all of the marketing people in detention camps. □



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## TOXiC's lethal LAN box



### Technical details

- Athlon XP1700+ @ 1.89GHz
- EPoX 8KHA+
- Two 256MB PC2100 @ 310MHz
- Gainward GeForce4 Ti4600
- SB Live!
- Cambridge 4.1
- Two 80GB Seagate IV HDD
- AOpen 300 watt PSU
- Volcano 7+
- Four 80mm fans
- Custom side panel
- Custom paint job
- Handy LAN handles
- Mesmerising bubble tube

### The story

A good friend of mine who I kept meeting at LANs said that he had wanted to do a good modding project, so we chucked a few ideas around and eventually I got the case down to him so he could work on it. We wanted something different for the window – not a square or circle one – something with a bit of style. The unique feature on the case is the custom-made side panel, which is two pieces of plexi

silicon together with some air holes up the top. At the bottom of the window is a copper pipe that had been drilled with small holes, and hooked up to that is a pump. Fill the window up with water, turn the pump on and in no time you have a mesmerising effect of bubbles going up the side panel. To top it all off we moved the USB to the side for easy access so that I could use my USB light, along with a hinged side panel for easy access to inside.

## Rogue's Hotbox by Marcus



### Technical details

- ASUS CUSL-2C mobo
- 256MB Kingston SDRAM PC133
- SB Live! Digital Entertainment SE
- 5.1 speakers
- 16x Pioneer DVD
- 16x/10x/40x Sony CD-RW
- Lian Li dual LCD temp monitor
- Silver-plated DVD and FDD
- Enermax case
- ASUS V8440 GeForce4 Ti4400
- UV-reactive paint on CPU fan
- UV-reactive paint on card edges
- Two cold cathode tubes
- Front panel lighting control

### The story

I found this case when I was in the city one day, but I didn't expect to see any computer parts in there – who knew as I walked passed a shop that it would have the case that I wanted for so long! An added bonus was it was on sale! After looking at the case for 45 minutes, checking if there were any scratches and considering the very questionable price, I told my mate waiting at the door that I was gonna get it. She was shocked, 'cause that meant I would have to carry the

9.5kg case all the way from city to the train station and home. I got the case and as soon as I got home I started cutting the door and installed the extra window kit that I had, then I moved all the cold cathodes in. Once I'd done that I started ordering stuff: I managed to get two super-bright LEDs (blue and white), two DC switches and some light-duty wiring wire, started soldering on the CCT (cold cathode) and the LEDs, got that out of the way and started painting the cards with orange UV reactive paint.

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## Tux's Da Box Mk2



### Technical details

- One red neon
- Zalman cooler
- 24x burner
- 12x DVD
- 80GB Seagate 7200Rpm HDD
- 30GB Samsung 5400Rpm HDD
- 8GB Westan Digital 5400Rpm HDD
- 1.2 Tbird CPU
- Soltek DRV5
- Dual screen GeForce2 MX-400
- Zip 100
- SB Audigy
- 300 watt PSU
- Definite fanage :)

### The story

Well, I bought this case thinking 'no modding this time', but it happened I got a mate of mine – Johhnyboy @ stylesPC – to cut out the window for me, then bought some Plexiglas and attached it with some Velcro to the inside of the case. The whole mod took about five hours of messing around. It went down a hit at lunDUN – the big LAN we had down here – and it was one of the top cases there :). The total cost of

this mod was about NZ\$125. I need to get some slim neons at the top and on the side but other than that the mod is pretty much finished. Since that pic was taken I have modded my Zalman cooler and it has two 80mm fans instead of one 90mm fan. The whole thing runs off a 300 watt PSU. I'll be adding some removable HDD bays and six little laser LEDs I am yet to solder up:). The only problem is that it only has three 5½in slots so I can't really fit all the things I need to:).

## ze hOt d0g b0x



### Technical details

- AMD Athlon 1.4GHz
- 512MB SD-RAM
- Gigabyte GA-7zx-H
- NVIDIA GeForce2 MX200 64MB
- 80GB Seagate 7200Rpm HDD
- 20GB Quantum 5400Rpm HDD
- Pioneer 16x DVD
- Panasonic 8x4x32 CD-R
- NetGear FA311
- Enermax Var. 80mm fan (back)
- Sunon 120mm fan (top)
- Generic 80mm fan (front)
- DigiDoc
- GameSound Muse XL

### The story

Well it all started when I saw all the Hot boxes in Atomic. I wanted one, but it needed to be original. Firstly, I went out and bought a pair of nibblers, and after taking them back to Dick Smith three times I finally got a pair that worked. Then I set out to hack my case: a blowhole in the top, a blowhole at the back and a window in the side. The case was looking dull so I decided a few coats of paint were in order. I picked yellow but I ran out after the top and sides; when I

couldn't find the same color I marched down to my local Bunnings and returned with a can of red.

Then I purchased the switches and DigiDoc and made a little baybus. After blowing three of the DigiDoc fan adaptors I had to re-wire the baybus, but it works all good now =)

Then came the lighting: one red neon and two laser LEDs. After I got the effects I wanted, I rounded most of my cables, except for the IDEs that I bought. And now we have ze hOt d0g b0x, ph34r!

# Counter-Strike: Condition Zero



When it comes to online ballistic fury one name stands head, shoulders and holster above the crowd: Counter-Strike.

As you hold this weighty tome in your hands an official figure of 68,000 people are slugging it out playing Counter-Strike online at any time. So where does the developer of the game go now that it is a huge success online? The realm of single player shenanigans of course!

Condition Zero will be a solid step forward for the series, as the new game will focus on single player as well as multiplayer fun. The game is inspired by

the fictional works of writers like Tom Clancy and even more so by recent hot movies like *Blackhawk Down*.

In Condition Zero the parallels between the game and the above mentioned movie are obvious: in one of the action scenes you'll be racing for cover from a crashing helicopter clipped by a terrorist's rocket. This sequence, which runs using the in-game engine, looks great and gets the adrenalin pumping at the start of this mission.

The basic premise is that you are a highly trained anti-terrorist soldier flown into hot spots around the world to diffuse dangerous situations. The single player game will feature over twenty missions and the code will include one hundred and sixty character models, all based on

digitised images of real people. This is a huge step up from the eight or so which featured in the original game, and the digitised faces look great. At the demo held at E3 in May, it was even possible to recognise people you knew.

The missions see you travelling the globe to conduct hostage rescues, search and destroy missions, bomb hunts and escort missions. You'll fight alongside accurately modelled Russian Spets Naz, GSG9 troops from Germany, the English SAS and the American Navy Seals.

Condition Zero was impressive to watch. The 3D engine now features cool touches like deformable terrain and some really nice weapon flashes and fire effects. The game should be out by the end of the year.

## GAME DETAILS

**WHY WE CARE:** Borrowing from *Blackhawk Down* is an inspired move and should make for a hell of a game, even if it is sans Eric Bana.

**DEVELOPER:** Valve / Gearbox [www.valvesoftware.com](http://www.valvesoftware.com) / [www.gearboxsoftware.com](http://www.gearboxsoftware.com)

**PUBLISHER:** Vivendi Universal [www.vivendi.com](http://www.vivendi.com)

**PLATFORM:** PC **DATE:** Q4 2002

# Terminator Dawn of Fate



Arnie might be absent, but there is a new *Terminator* game in the works, called Dawn of Fate. The game will be set before the two movies, but it will also jump about in time as you follow robotic assassins back to the 1980s.

However, the bulk of the action will be set during the bleak and fictitious future of 2027 with mankind seriously under the gun as the mechanised legions of Skynet androids seek to crush all life using any means necessary.

Naturally you'll lead the fight against the rabid cash registers and other junk, taking a part in the much talked about,

but never seen, assault against the Skynet HQ that was spearheaded by Kyle Reese and John Connor.

As well as the fateful assault there'll be stealth missions, squad-based stuff and search and destroy sorties where you have to protect people from the liquid metal assassins and the more common terminators. There will be movie-inspired enemies as well as new massive crawling tanks, HK airborne assault craft and individual Terminator robots.

In the game you'll control Kyle, the hero who goes back to the past in the first film in the series, as well as two other characters.

Dawn of Fate should feature around 12 missions set in diverse locations such as machine factories, wastelands, underground human hideouts, less war

torn places in mankind's past as well as the fortified home of Skynet. Paradigm will give you twenty weapons to play with.

As you'd expect, there'll be machine guns and rocket launchers, but sniper weapons and some futuristic technology are also on the menu. Best of all, you'll get to use the massive chain gun Arnie wielded in the second movie.

Deformable environments will be par for the course and you will be able to hop in and out of a range of vehicles as well.

Having seen the code in action in the US, Dawn Of Fate looks like it is inspired by some top notch games. The use of squads and large scale environments is very Halo, and you'll be able to blast Skynet's androids skyward with a move which looks like it was heavily influenced by the action in Devil May Cry.

## GAME DETAILS

**WHY WE CARE:** The biggest ugliest robots in the business want to wipe out mankind so bloody oath we care!

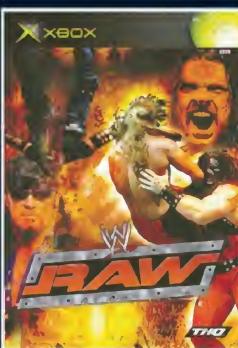
**DEVELOPER:** Paradigm

**PUBLISHER:** Infogrames [www.infogrames.com](http://www.infogrames.com)

**PLATFORM:** Xbox / PS2 **DATE:** TBA

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Bioware. Now here is a name which conjures up images of many many people hunched over their PCs grinning maniacally into the wee small hours. Being responsible for games like Baldur's Gate and the recent AD&D smash hit Neverwinter Nights is certainly something likely to give the punters high expectations. Now we look forward to the next Bioware opus: the *Star Wars* adventure Knights of The Old Republic.

Knights will begin during a time around 4000 years before *Episode One*, when Jedi and Sith Lords are in great numbers and locked in deadly combat with each other with a corner of the galaxy as their bloodied battleground. Destinations like Tatooine, the Jedi home base in Dantooine, the Sith enclave on Korriban and even the Wookee home world Kashyyk will be on your list of places to play. You will also get a spaceship to fly, called the *Ebon Hawk*, and there will be a multitude of weird and wonderful life forms and droids to interact with.

In this promising epic you'll be able to determine your Jedi Padawan's skills in areas such as strength, stamina and Force powers. Your character's appearance and special Jedi feats will be to your whims.

There will be around 10 characters to choose from, but you will also be able to play a role in character development, a must in any decent RPG style adventure. Venturing over to the Dark Side will be a tempting option and the plot will change depending on your allegiances. Given Bioware's skill

at shaping complex plots and making for multiple paths through the narrative, this should make the game pretty good value in replay terms – just like Neverwinter Nights.

There will also be many moral choices in the game and the decisions you make will determine to some extent the way you are perceived in the gameworld, as well as your character's development. So if you decide to raise a village of Wookiees to the ground don't be surprised if NPCs flee from you everytime you walk down the street. Interestingly, Jedi dress will even have an influence on the other characters you come across in the gameworld. No matter how good a Jedi's intentions, if you skulk about in a black robe certain NPCs will view you very suspiciously. Talk about judging a book by its cover.

This opens up some interesting gameplay possibilities as disguises and mind powers should lead to some really engrossing stealth style missions. Combat will feature a blend of real time and turn-based elements, which for the moment is a pretty vague description on Bioware's part. But having spoken with the guys regarding the game, the aim is to provide the strategic choices of turn-based combat while also adding some arcade real time elements to make the action feel more immediate. These lofty goals might lead to interesting results.

Star Wars KOTOR will be released on Xbox by the end of the year and a special 'reworked for PC' effort will lob early next year.

## GAME DETAILS

**WHY WE CARE:** It is the first time legendary names Bioware and *Star Wars* have been brought together for a game. How can we not be apoplectic with anticipation?!

**DEVELOPER:** Bioware [www.bioware.com](http://www.bioware.com)

**PUBLISHER:** LucasArts [www.lucasarts.com](http://www.lucasarts.com)

**PLATFORM:** PC **DATE:** TBA

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# The fastest video card ever

James Wang delves into the tech that makes up ATI's new King of Speed, the R300. But the benchmarks are where it's at, so Bennett Ring benchmarked the living bejeezus out of the first R300 in Australia, a Gigabyte RADEON 9700 Pro. Read on to find out why you need this video card. . .

'0.13 won't be ready, we're going for 0.15,' – and with that, the camera zigzags its way through ATI's labs, up the elevator, past the security guard and into the Canadian sky. Soon, it dives down with great speed and stops right outside of NVIDIA's HQ in Santa Clara: 'We'll hit for early 0.13, push TSMC and do ATI like we did 3dfx!' – David Kirk then extinguishes his cigar and returns to his labs to aid in the conceptual design of the NV30.

That could have been the next Tony Scott film, or, maybe it was what happened some two years ago when the core decisions were made on the DirectX 9 parts from ATI and NVIDIA. In this tech review, we'll not only see what makes the R300's magic happen but also how history ended up at this point; NVIDIA in second, ATI leading the pack.

## Visual Processing Unit

ATI's west coast design team developed the R300 core. Consisting mainly of ex-ArtX engineers and designed by the same team who gave birth to the Gamecube's Flipper GPU, the R300 is somewhat different to the RADEON 8500 (R200) in design philosophy. No one really knows how ATI managed to double the transistor count from the R200, double the pixel pipelines, add a costly 256-bit memory interface and still manage to increase the clock speed by 50MHz on the same 0.15-micron process. Much of this has to do with the CPU style design. Using a flip chip format, the R300 can better deal with its 1000+ pin count and as a bonus can look more like a naked CPU.

Like the P10 and Parhelia, the new

RADEON employs a true 256-bit memory interface, made viable by using BGA (Ball Grid Array) memory modules. This type of packaging not only looks discreet and sexy but also reduces routing and pin count problems by hiding the pins under the package rather than having it protrude from the side. ATI engineers also incorporated DDR-II support, which should surface sometime next year. To help with granularity, a four-way crossbar architecture is used. Splitting the 256-bit bus into four 64-bit channels greatly aids in efficiency for small chunks of data transfers and is now virtually standard on high end GPUs.

## The vertex and pixel pipelines

DirectX 8 had support for two Higher Ordered Surfaces (HOS): N-patches and Polynomial surfaces. ATI supported N-patches and NVIDIA the latter. While each have their pros and cons, N-patches were easier for direct implementation and hence found their way into many popular titles (CS, UT, RTCW), even though the implementation lacked fine control. The R300 vertex engine can process floating-point tessellation levels as well as dynamic tessellation based on distance. Together with support for displacement mapping, the R300 is as well armed as Parhelia on the primitive processing front. In terms of flexibility, the R300 exceeds the baseline specs of DX 9 in many ways. The quad vertex shader array (the R200 has one while the GeForce4 has two) supports up to 65026 instructions for the vertex shader alone, allowing loops, subroutines and flow control much like a C program. With the added flexibility and

control, in the soon future, simple CGI can be rendered offline using nothing more than our humble GPUs.

## Pixel engine

Doubling the pipeline comes hand in hand with the extra bandwidth. While Matrox may have been the first to remove the memory bandwidth bottleneck, it did a poor job as its efficiency was far from optimal. The R300 balances fillrate and bandwidth with great elegance. 20.8GB/s is just right for the traffic generated by an 8 x 1 pixel pipeline array. Although it would be nice to have two texture units per pipeline for single cycle dual texturing, it would not result in great gains in the real world unless higher bandwidth is available. Each texture unit of the pipeline has its own pixel shader and can 'loopback' up to 16 textures before writing to the frame buffer. By using loopback, texture information is worked repeatedly on the fly and hence does not lose accuracy as it would if it was written into the frame buffer. Another important benefit is the maintenance of higher dynamic range, which we shall soon see is central to higher quality pixels and reaching 'Toy Story on chip'.

## Micro pipelines

It's also remarkable that ATI has pipelined the pipelines inside its vertex and pixel shader. In our classic view, we tend to think of pipelines as thin pipes processing data. But with the advent of programmable pipelines, many unique instructions can be sent down and a shader unit can greatly benefit if it can



process these instructions in parallel. The R300 can process vector and scalar operations in parallel for its vertex shader. In its pixel shader, up to three common operations (lookup, address and colour) can be executed in one cycle. Due to the emphasis of shaders, we expect greater use of instruction level parallelism in future architectures.

### The need for more accuracy

Just when you thought Matrox is going overboard with 40-bit (integer) colour support for Parhelia, the R300 comes along boasting 128-bit colour, in a floating-point format! Why do you need 128-bit floating-point colour when your monitor can display no more than 40-bits? It's like having a colour TV with a final filter that cuts it down to black and white. After all, CGI films like *Final Fantasy* only use 64-bit. Massive overkill? Not quite.

If you follow what is done in the rendering pipeline, you'll find that a lot of the operations involve multiplications and averages. This is especially true when it comes to pixel shaders. Imagine a simplified scenario where you have to multiply many floats (decimals) by hand. A classic DX 8 pipeline would do it in a similar fashion as any human would: multiply the first two, write it down, multiply that number by the next and so on. The problem is the 'writing it down' part. Exactly how many decimals do you keep? It's not hard to see that if you don't keep enough decimals, by the time you're done with a lot of numbers, you've lost accuracy. This isn't hypothetical – it happens with every 3D game. Texture artists often have to create their textures extra bright to compensate for the loss of saturation when computed by the rendering pipeline. Now think ahead, when pixel shaders carrying hundreds of instructions long are executed, can you afford to lose accuracy? The bottom line for complex operations is that if internal calculations are not done with enough accuracy you might not even output 24-bit true colour in the end!

### Triple A

With the R200, ATI had a very mixed bag of anti-aliasing and anisotropic capabilities: its high quality super-sampling based anti-aliasing was too slow while its fast

anisotropic filtering had some quality issues. The change made to the R300 in this area really makes it shine. Multisampling (2x, 4x, 6x), an anti-aliasing algorithm that suffers no fill-rate penalty and does not blur textures, is now finally on tap. The image quality using this algorithm is enhanced through programmable sampling patterns, although to be frank we don't expect much explicit support for this feature. However, the default sampling pattern uses rotate grid jittering (like the Voodoo5), which would produce better edge quality for near vertical and horizontal polygon edges. The biggest advantage in using MSAA is the incredible speed gain. In a non-bandwidth limited scenario, the theoretical performance hit should be less than 10%. (Check our benchmarks – it actually turned out to be around 13% in a worst case scenario).

Gamers love the RADEON's anisotropic filtering, because even at high resolutions, the performance hit hardly exceeds 10% in most cases, thanks to its smart adaptive method. However, the inability to combine tri-linear filtering when applying AF became a small gripe with the online community, and another problem was that polygons at certain angles would not be filtered correctly. These issues have caused some Websites to boycott ATI's anisotropic method and refuse to compare benchmarks. I encourage you to ignore these silly teen-sites, because the R300 makes tri-linear filtering with anisotropic finally possible and the performance hit has largely been unaffected. ATI also claims to have fixed the polygon angle problem, which together with its superior 16:1 peak sampling rate would make the RADEON 9700 what the Parhelia wanted to be: max performance and quality with a minimal performance hit.

### Monkeys?

Contrary to the conclusion some people would jump to, RenderMonkey is not ATI's version of Cg. RenderMonkey is a tool to help developers incorporate shaders without having to go through complicated assembly. There are three high level shading languages (HLSL) currently proposed: DirectX 9, OpenGL 2.0 and Cg. The only one currently available is NVIDIA's Cg, which

RenderMonkey can theoretically support via plug-ins. You can think of RenderMonkey as Photoshop for the 3D artist: instead of writing shaders in assembly, you can now write it using any HLSL and RenderMonkey will understand and compile it for you. Any effects will be directly viewable without firing up the game engine. The implication these kinds of tools may have on games, developers and CGI studios is far-reaching and exciting. By supporting the Renderman language and nicknaming the tool itself to RenderMonkey, ATI is positioning itself to bring together the real time but inflexible gaming world to the fully flexible but non-real time CGI universe.

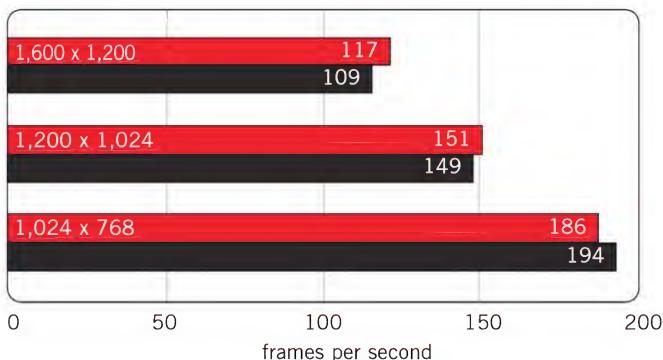
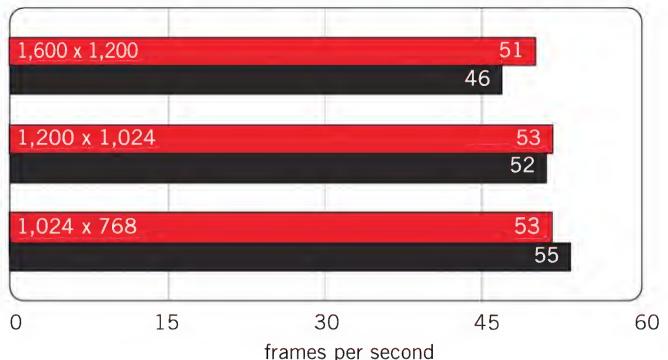
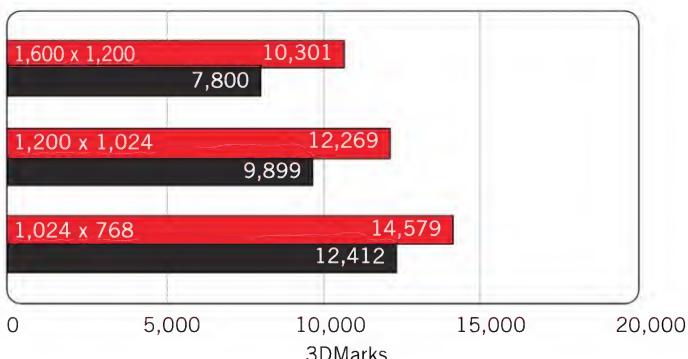
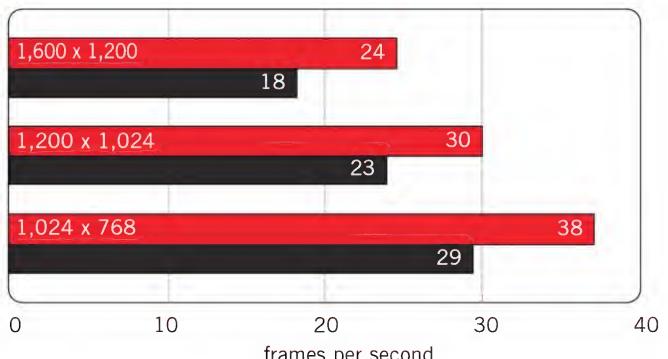
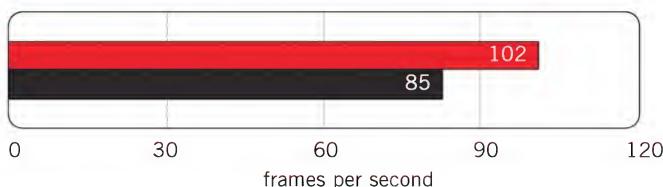
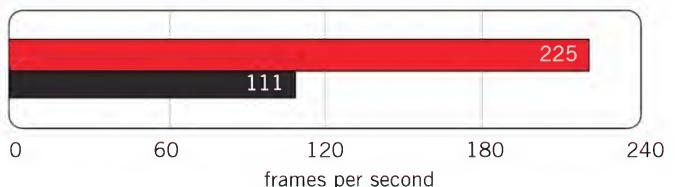
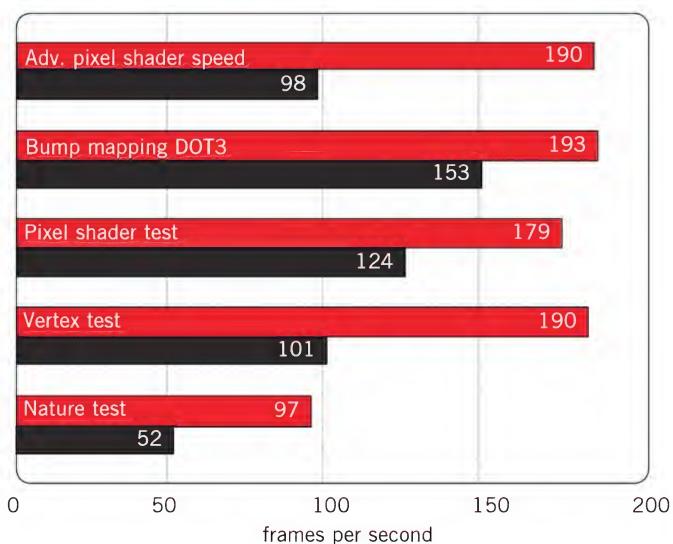
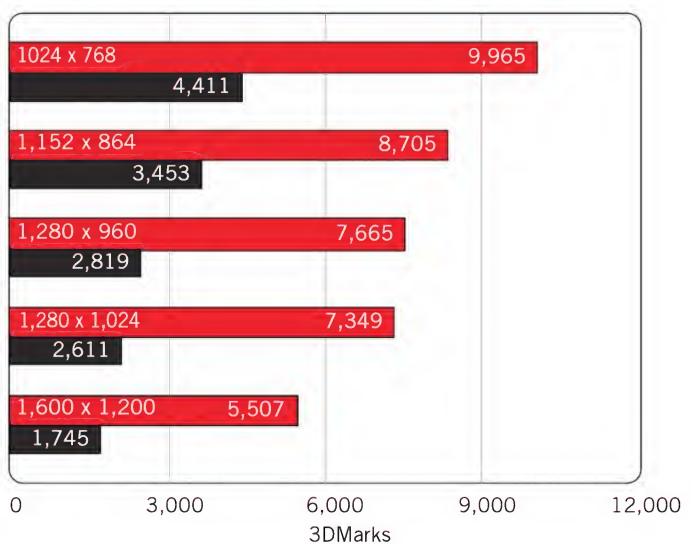
### The state of 3D

NV30 has just taped out as I write this. Given that 100 days is the norm from tape out to production, realistically, no one will be able to buy one until 2003. The reason why it's taking so long is quite clear: this is NVIDIA's first new architecture since the RIVA 128. Coupled with the 0.13-micron manufacturing troubles at TSMC, this will be NVIDIA's first major miss in history. (Or is it due to the 3dfx curse when it took in those 100 engineers?)

ATI has done the best job possible on the RADEON 9700. It has learnt from its mistakes and extracted the best of proven strategies to deliver a graphics processor that leaves little to be desired. It takes IQ gaming to a new level by allowing anti-aliasing and anisotropic filtering to be applied at the highest resolutions and still produce three digit frame rates. The immediate benefit from this and the long term benefit of DX 9-compliance makes this card the clear choice for those who want the best at any given price. Although it's not quite the technical enigma that Parhelia may be, the RADEON 9700 delivers where it counts the most: speed.

### The results

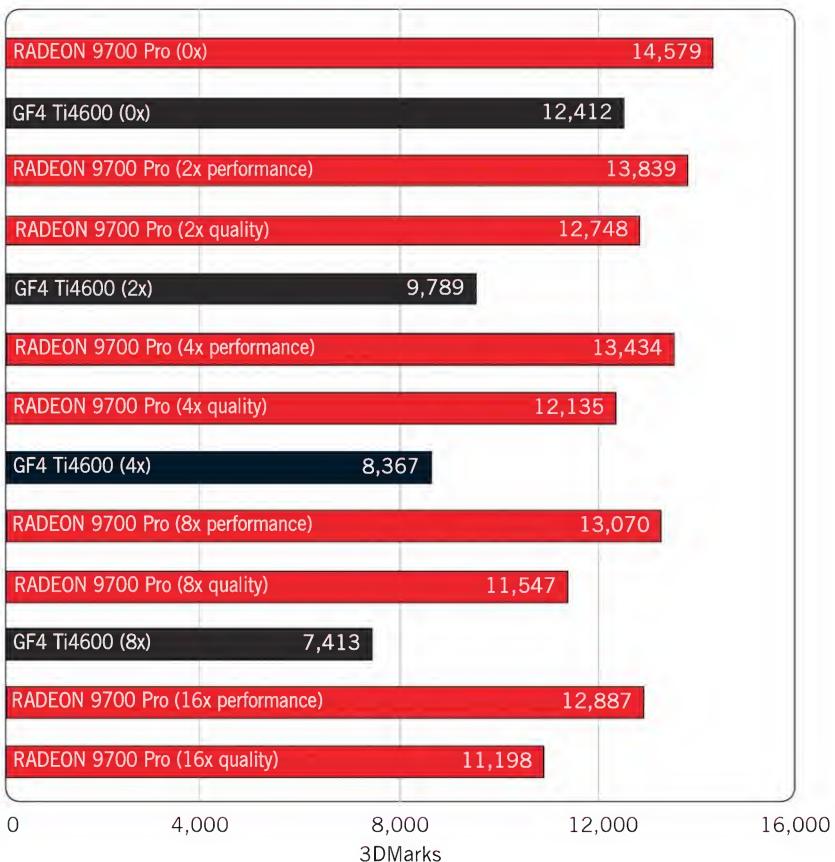
We have to give a huge thanks to Gigabyte ([www.gigabyte.com.tw](http://www.gigabyte.com.tw)), who went through a saga of epic proportions to get us the first R300 sample in Australia. To test the card, we used a VIA P4B400 P4X400 based

**Quake 3: Arena Max (OpenGL benchmark)****Comanche 4 (DirectX 8.1 benchmark, CPU limited)****3DMark2001 SE (DirectX 8.1 Benchmark)****Code Creatures (DirectX 8.1 benchmark)****Dungeon Siege (Direct3D benchmark)****SharkMark (Matrox vertex benchmark)****3DMark2001 SE individual results****The Big Hurt Test (3DMark 2001 SE, 4X AA, 8X Aniso)**

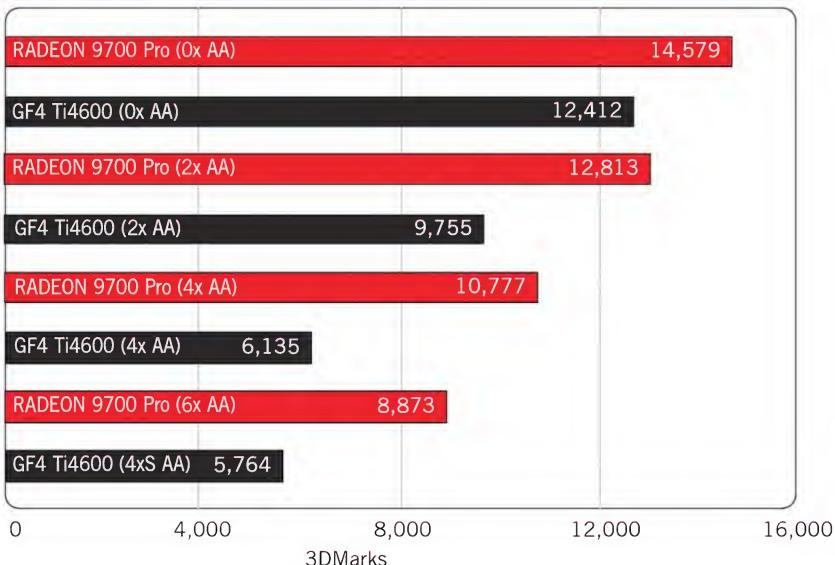
Gigabyte RAIDON 9700 Pro   GeForce4 Ti4600



### Anisotropic (3DMark2001 SE default settings)



### Anti-aliasing (3DMark2001 SE at default settings)



motherboard, with a 2.8GHz P4, and 512MB of DDR-RAM running at 333MHz. We used these fast components to limit the memory and CPU bottlenecking, therefore giving the R300 more room to stretch its wings.

The Quake 3: Arena tests were quite surprising, with the R300 coming out

slightly behind the Ti4600 at 1024 x 768 resolution. However, as the resolutions rose, the increased memory bandwidth of the R300 made it the clear winner. Comanche 4's results were a bit of a puzzle, until you realise that at the lower resolutions, the game is CPU bound. However, at the highest

resolution the Ti4600 slows this benchmark, while the R300 still has plenty of room to move. Dungeon Siege, which traditionally favours NVIDIA solutions, was the first benchmark where we saw the R300 clearly surpass the Ti4600. And from then on, as we progressed into the benchmarks that made heavy use of DirectX 8.1's pixel and vertex shaders, there was no looking back for the R300.

3DMark2001 SE saw the R300 lead by a margin of at least 18%, increasing up to 32% at 1,600 x 1,200.

Code Creatures performance was just as impressive, with an average performance increase of around 30% across all resolutions. For once we actually got to see what this benchmark looked like with a decent framerate.

We used Matrox's new SharkMark benchmark to focus purely on Vertex shader performance, as that's what it's designed to show. As you can see, the R300's vertex shaders absolutely whipped the Ti4600, with an amazing performance increase of 202%! As more games start to use Vertex shaders, you can be sure the R300 will have the grunt to do them justice.

We don't usually include the individual 3DMark2001 SE scores, but as you can see we simply couldn't leave them out for the R300. These really highlight the strength of the R300 core – performance when using DirectX 8's advanced features. We would have loved to check out its DirectX 9 performance, but alas could not obtain a single reliable or stable DX 9 benchmark. The final three tests were based on anisotropic performance, anti-aliasing performance and a combination of the two. We stuck with 3DMark2001 SE for these tests as ATI's anisotropic filtering is apparently buggy in OpenGL. As these tests show, we finally have a graphics card that will let you play with all the bells and whistles on at a smooth frame rate. Anisotropic performance was very impressive, with little visual difference between the quality and performance settings. As a result, we used the performance setting for The Big Hurt Test. This combined AA and anisotropic test showed the most impressive performance difference between the two cards, with the R300 having a lead of 315% at 1,600 x 1,200!

These results show the R300 is without doubt the fastest video card on the planet. Stay tuned, because next month we'll delve into our overclocking bag of tricks to see just how fast this brand new architecture can go.

# Zen and the art of LANning

Simon Peppercorn and Stuart Denham cock their assault weapons and go on a deep penetration mission inside the LAN party, coming out of the darkness wired for action.



Images from [www.computermods.com](http://www.computermods.com)

As little as 10 years ago, multiplayer gaming was tedious and archaic when compared with today's standards. 'Woot' wasn't even a real word back then. But for many, those primordial beginnings were the start of an addiction more powerful than nicotine, caffeine-based energy drinks or early editions of *Hyper* magazine.

In the days before the Internet was available to most households, many of us turned to Bulletin Board Services (BBS) to get our online interactive fix. For those who missed out on BBSes, they consisted mainly of an isolated, ANSI telnet session to another computer, allowing a caller to send and receive email between other BBS users, participate in newsgroup type discussions, live chat and primitive online games.

By the mid-nineties, games like Doom, Rise of the Triad and Decent began appearing. Offering one on one, IPX connections over dial-up, they worked fine for the most part, even on 14.4Kb/s modems, but restricted play to only a couple of users. Then with developments such as IP-based multiplay over a local area network and the Internet, games evolved to include many more simultaneous players and dedicated game servers became commonplace.

More households were finding themselves with Internet connections, and often more than one PC. Combined with the affordability and ease of setting up a LAN in the home, innovation and technology was driven forward and the demand for multiplayer action grew. With the arrival of famed multiplayer successes such as Doom II, the need for faster, lag free alternatives to remote access gaming were apparent. People all over the world started trucking their beloved computers across town, to their friend's places and scout halls alike.

Looking at multiplayer action today, on the surface, the puritanical interactive aspects of multiplayer gaming seem to be taking a backseat to the fervour of competition and clan wars. Combined with the building of communities of like-minded enthusiasts, the LANning phenomenon has been allowed to flourish.

More and more people are becoming regular attendees of LAN events, and dutifully rolling up with their customised rig under one arm, a six-pack of Jolt under the other. But for the first time LANner, things can seem a little daunting.

## Growing your own LAN

So you went to the *Atomic WorldLAN* last year in Melbourne. You've probably been to a few of SGL or Shafted's LANs too. Almost certainly, you and a few buddies have got together for a weekend of pizza, refreshments, and furious LAN gaming. You may even be considering hosting your own event.

The success, or otherwise, of organising a LAN outside of your own circle of friends is dependent on the quality of the preparation and planning that goes in before the event itself. If you do decide to take the plunge, and create something more than a clumsy garage type LAN for your buddies, here are some guidelines to give you an idea of the sorts of issues you need to be aware of.

Hosting a LAN is not a plug-and-play experience. As organiser/host, there are many choices, and many responsibilities that must be considered.

If it is your first attempt at setting up a LAN, try to keep the numbers at a manageable level – perhaps 25 or so.

The following key areas, in no particular order of importance, need to be carefully thought out:

- Location (Where will the LAN take place?)
- Provisions (What other supplies do I need to provide to keep players happy?)
- Publicity (You want people to know about it, right?)
- Funding (Nothing comes free, it just depends who paying...)
- Hardware (What kind of gear will I need to provide to make the LAN work?)

Don't be too adventurous. For your first LAN it's usually better to keep the number low; that isn't to say that a 50 player LAN would be impossible – just a little daunting if it's your first attempt at organising one.

Plan carefully, as people will expect you to give them a good time, especially if they are paying to play. You need to be professional in your approach and attitude. If you choose to host a larger LAN, find some friends or local game-heads that you think could help out. Give them free entry for their efforts and let them know they're appreciated.





## Location

Be sure to choose a venue that suits your LAN's size. Ask yourself the following questions: Will the venue fit my gamers? Will it be cramped? Is there room for people to move around? Is there a place for gamers to lie down and watch some TV or play some sort of console game? Is it way too big?

Be sure the venue has adequate parking and wide entrances for moving tables and other equipment through. It may also be wise to try and find a neighborhood that is not likely to complain about the noise. The raucous curses and cheers of a large group of overly caffeinated gamers, fragging each other till the wee hours, can be too much on even the most tolerant neighbours.

Look for a place that will meet your power requirements. The best place to start is to have a gawk at the circuit breakers. Fifty PCs all drawing power from one socket will earn you no friends. [www.fragtopia.com](http://www.fragtopia.com) recommends: 'You can run about 4-5 machines comfortably on a circuit. It's important to note that that is not per outlet. . . that's per circuit. . . So if the location has one breaker for 50 outlets, you've got a problem. . .".

Keeping your gamers happy should be priority number one, so it is highly suggested that you find a place that is air conditioned, for both hot and cold conditions. A hot room will make people cranky and irritable and have overclockers wanting your blood. Importantly, look for a place with clean, well-maintained toilets. All that Jolt and pizza will provide some very nasty surprises if you fail to notice out of order bathroom facilities.

## Provisions

Your average LAN will go overnight, usually across a weekend, so be sure to set aside a place for people to bed down in their sleeping bags if they get tired. Some of the larger LANs set aside an area for console gaming too, with bean bags for comfort.

Bung on a BBQ to keep your gamers well nourished, and ensure plenty of refreshments are available too. Bowls of lollies on every table are a good idea. Discourage the consumption of alcohol, for a whole bunch of reasons.

Perhaps set up a help desk-type service. Assist those with technical difficulties who aren't as adept as you, in fixing all

manner of PC problems. Have a CD handy with all the standard drivers and utilities. Eg. Detonators, VIA 4in1s, SoundBlaster series, WinZip and so on. People should be asked to bring their operating system installation CDs along as well, should an unexpected reformat be required.

Have CDs of any game mods you plan on using, as well as the latest game patches. Gamers won't be happy having to sit out on maps they don't have installed, or if the server is running a later version of the game than the player.

## Publicity

Now you need to get your LAN out there. Think up a catchy title and make up a nuffy FAQ Website, nothing fancy, just the details and any extra stuff you want to add. The best way to get people to your LAN is through posting the event to a community site. Ausgamers ([www.ausgamers.com.au](http://www.ausgamers.com.au)) is a good place to start. That site will allow you to post details of your LAN, even allowing people to register directly there. Post this information at least a month before the event, giving you ample time to make any little changes without causing too much confusion. Look around some of the online forums and post about your LAN, and maybe also get some advice on making everything run smoothly.

You may wish to advertise in the local papers, or put up a sign at the local Internet/LAN cafes. Do bear in mind, however, that advertising your LAN in the public domain will lead to a bunch of strangers making up the numbers on the day. There is some risk here, as you don't know who could possibly turn up, and how well they will behave themselves while they are there. Consider having a couple of burly looking guys with dark sunglasses, standing around pretending they wouldn't rather be playing. Better still, if the budget allows, give the local security company a call, and have someone there for the duration, should the louts get out of hand. Security may also help minimise the likelihood of theft.

## Funding

Once you've decided on how many players will be attending your LAN, you need to check your expenses and allocate appropriate entry fees. If your party is between a small group of people then ▶



## '...you are all expert project managers, so you will have considered all your risks, and made allowances should it all go cumquat shaped... you will have prepared for the worst, having spare parts should a server die.'

usually you can afford to be nice and charge nothing, perhaps just sharing any expenses you may incur. Once you get over the 25 player mark then you start to need more equipment in terms of network hardware, tables/chairs and so on. The best course is to add together the expenses from the equipment hire, the venue hire (if applicable) and any other miscellaneous expenses, and divide it among your intended players. When charging for a LAN take into account that you are crossing a very serious threshold. Someone who pays for a LAN expects quality, with good servers and a clean, fast network. Any incompetence or errors on your part can become an awkward situation for you to manage. Fast talking and deft negotiation skills will be handy should it come to that.

If you are looking at hosting a larger event, then you may consider bringing in a sponsor or two. But remember that you don't get what you don't ask for. By now most of you are on a first name basis with your local computer shop owners. You may get a few rejections, but for the one who says 'yes', the quest will have been worth it.

Suggest to potential sponsor(s) that in return for the free advertising, and perhaps the opportunity to set up small stall to trade their wares, they could contribute money towards the setup costs and maybe even provide either some hardware or games to give away as prizes. Everything that is contributed, without financial cost to you, is a bonus for your LAN, and attendees. Whatever is left over at the end, can be injected back into your next event, to make it bigger and better. You may even consider donating any profits to charity.

When working with sponsors you want almost everything down on paper. It may be appropriate to draw up an agreement, and get it signed off. It will help to confirm the sponsor's participation and contribution. Holding raffles, or lucky door prizes of funky new hardware will provide incentive for people to come. Even the placements of a few posters or products on display can change a LAN into something very professional looking, so be sure to search with vigour.

### Hardware

While conceptually, setting up a local area network is pretty simple, there is actually a lot of equipment and preparation required to make it run well.

Your first consideration when working out your technical requirements should be the use of dedicated servers. While a user on the network can easily host a game of his own, once more than five people join the network it can quickly become laggy and unstable. The solution would be to run servers dedicated just to hosting those games. Optimally, you would have one dedicated server for every 15–20 users. This is going to mean five or more servers for up to 100 people.

The best sources of spare systems are your friends. Get them to bring their spare boxes along and let them feel special by running their own server. You may even be able to persuade your sponsors to provide necessary hardware for the event.

As a side note, multiple servers mean you can have a number of different games running at the same time. Variation in games is paramount in maintaining enjoyment levels and stopping people

leaving before lunch. Give your gamers a choice. As much as *Soldier of Fortune II* kicks arse, almost no one wants to play it for 48 hours straight. (We said 'almost').

In terms of the network itself, go for switches instead of hubs. Routers would be even better, although some knowledge of TCP/IP addressing and router configuration would certainly be handy. For even a basic LAN event it is recommended that you used at least a 10/100 switched network. If you are exceeding the 50–100 player mark then you may choose to upgrade to gigabit Ethernet, but it ain't gunna be cheap.

It may also be appropriate to set up a DHCP server to take care of those IP addressing issues. This can be as simple as a properly configured, low spec'd PC sitting in a spare port on the network, running NT, 2K or XP.

While most hardcore gamers have the fortitude to stay up all night with the help of caffeine-type stimulants and a bit of fragging induced adrenaline, some people need to work the next day, or just want to be coherent in the morning. End your LAN late in the next afternoon and offer some incentives for people to stay around and help clean up, maybe a few blank CDs or some free drinks.

Naturally (!) you are all expert project managers, so you will have considered all your risks, and made allowances should it all go cumquat shaped. In fact, you will have prepared for the worst, having spare parts available should a server die on you, maybe even having a backup server or two on standby, to minimise downtime. You prepared yourself with loads of spare cable, network ports, power leads, boards and adaptors. You developed contingency plans for all manner of catastrophes that may otherwise ruin your well organised, sponsored, community minded and technically perfect event. Right?

Realistically, things do go wrong – often things you may not have prepared for. Just make sure you have a good support team to help identify and resolve problems as they occur. No one is Superman. Don't try and do it all on your own. Kudos is one thing. 75 people screaming for your blood is something else.

Hosting a LAN is a challenge, but success is immensely rewarding. If you don't want to host your own, then still participate, collaborate and be a part of an ever-growing community. If you are looking for LANs to attend, then don't think that the smaller they are the better, especially when you are starting out. Always go for the bigger LANs, where there is a larger group of people not only to interact with but also to give you help if you need it.

But is it all just a fad? It could be argued that the number one threat to LANs in Australia comes in the form of an increased rollout of low cost broadband connections. With more and more gamers making the switch to Cable and ADSL, we have to ask if people will continue to lug their systems to LANs which are dominated by a relatively small selection of games, uncomfortable seating and cold pizza.

This problem can be countered by developing LANs into more of a social event, concentrating more on the interaction and community spirit of gaming events rather than the simple desire to compete. Offer something that anonymous Internet gaming doesn't. Build it, and they will come.

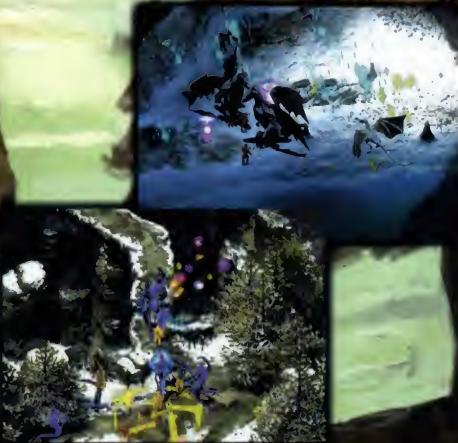
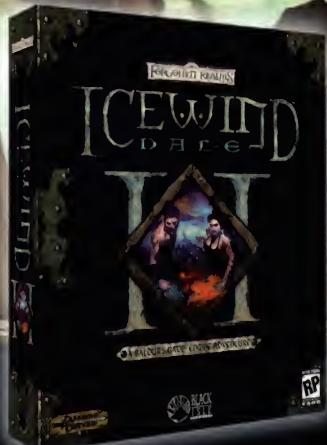


FORGOTTEN REALMS

# ICEWIND DALE II

"Icewind Dale II looks to be a fitting capstone to the wave of truly excellent party based role playing games."

IGN.com



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# DDR II vs. QBM vs. RDRAM

James Wang has a look at some up and coming unforgettable memory technologies.

Will the next generation of memory have the same impact that DDR did?



In every architecture article we've published, you'd be hard pressed to find one that didn't drive home the importance of bandwidth. Reaching higher frequencies offers us the possibility of faster processing but higher bandwidth has made that a reality. Only recently have graphics accelerators balanced the fillrate and bandwidth equation thanks to the new 256-bit memory interface. Overall, system bandwidth is still being upset by insane front side bus speeds and low memory bandwidth. This has made high bandwidth memory solutions highly sought after. A variety of vendors are going after this \$21 billion market using radically different architectures. Which type will be powering your next *Atomic* box?

## Mega traffic jam

A Pentium4 running on the 533MHz front side bus is a gluttonous beast that can consume up to 4.2GB/s of system bandwidth. With the new AGP 8x standard, up to 2.1GB/s is needed for all those massive textures and vertex streams. The AGP and CPU both fetch this data from the system memory via the motherboard Northbridge. It's slightly sad that the fastest memory available today, 32-bit RIMM4200 can only muster

a peak of 4.26GB/s primary system bandwidth. This is a far cry from the 6.3GB/s that may be needed from the CPU and AGP in the worst of cases. This is excluding the requirements of the motherboard Southbridge, which, while arbitrating all the PCI devices, also has to take care of your hungry IDE devices. Every device in your computer is begging for memory and memory speeds aren't keeping up with demand. This has led to the development of key upcoming memory technologies: DDR-II, 32-bit RDRAM and QBM Memory.

## The second coming

DDR memory wasn't a bit faster than normal SDRAM – it only carried twice as much information per clock. Under the same principle, one would be tempted to guess that DDR-II, a standard pushed by a large body of tier one semiconductor companies, would be using the same clock but carry four times the information than standard SDRAM by using many edges and inflections of the clock. This is not the case. DDR-II is architecturally designed to natively facilitate higher frequencies. A rule that you may have observed is that higher grade memory always appears first on graphics cards.

This is true for the original DDR memory, first adopted by the GeForce 256 GPU. This pattern also gives us some insight into future motherboard memory. Current high end GPUs use BGA (ball grid array) memory chips and very soon, this form factor will be passed down to main system memory. This will come with the arrival of DDR-II. As BGA uses balls (yes I know) on the underside of the die rather than pins (TSOP form factor), it has a smaller footprint. The balls have much lower capacitance load than TSOP and this allows DDR-II to be clocked about 40% higher, module for module.

Stub is the distance between your motherboard traces and the bottom of the memory chips. Current DDR memory has rather long stubs in comparison to RDRAM and this is not good for signal strength, which is important for high clocks. DDR-II will incorporate shorter stub distances to boost clock speed. With fancy tricks such as programmable impedance and on-die termination, DDR-II is projected to launch at an initial speed of 266MHz. Unfortunately, the final seal of approval has yet to come from JEDEC, meaning for now at least, you won't be seeing DDR-II in motherboards but rather on graphics cards.



Designed for eXtreme Performance



## Stay in Step with the Evolution

The A7V8X is the world's first and only motherboard to incorporate all four advanced industry technologies - AGP8X, Gigabit LAN,, DDR400 and Serial ATA, allowing you to stay ahead of the motherboard evolution.



Winner of Tom's Hardware Guide's Reader's Choice Award

### A7V8X

- Socket A for AMD Athlon XP/Athlon/Duron
- VIA KT400 + VT8235
- DDR 400 Supports
- 1 AGP 8X Slot
- Flexible Serial ATA and ATA133 connectors (optional)
- RAID 0 or RAID 1 Supports (optional)
- Gigabit Ethernet, USB2.0, 1394, 6-Channel Audio, S/PDIF-in/out (optional)

### P4S8X

- Socket 478 for Intel®Pentium®4 (Northwood/Willamette)
- SiS648 + SiS 963
- DDR333 supports
- 1 AGP 8X Slot
- Flexible Serial ATA and ATA133 connectors (optional)
- RAID 0 or RAID 1 Supports (optional)
- USB2.0, 1394, 6-Channel Audio, S/PDIF-in/out (optional)



### Serial ATA Technology

ASUS A7V8X and P4S8X also support Serial ATA technology. Serial ATA is the next generation ATA specification that provides

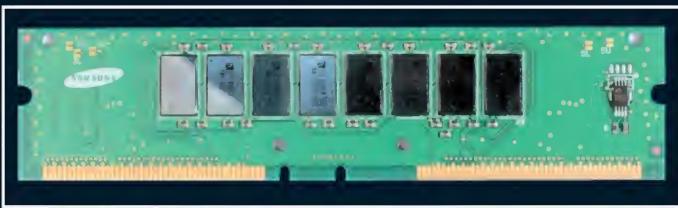
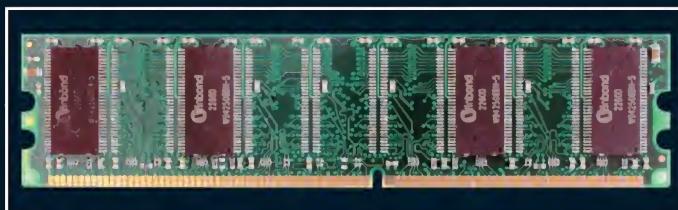
scalable performance for today and tomorrow. With up to 150MB/s data transfer rate, Serial ATA is faster than current Parallel ATA, while providing 100% software compatibility.

### Distributors

Achieva Technology Australia  
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**ASUS**  
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CLOCKWISE FROM TOP LEFT: DDR400, QBM and PC800 RDRAM (without its trademark heatspreader). Notice the differing levels of complexity of the varying PCBs as well as the chip types. RDRAM has considerably less complexity with nice clean tracers which reduce the potential for signal degradation. QBM memory has extra controller chips beneath each RAM module to manage the tricky skewing of clock signals.

## 'Be very careful, as two sticks of PC2700 DDR memory can seriously undermine your system stability.'

### RAM my BUS

RAMBUS, the memory technology company that everyone loves to hate, is still far from dead. Technologically, RAMBUS still has a lot going for it. RAMBUS is more a serial technology whereas DDR is parallel in nature. You may have noticed a shift from parallel to serial interfaces over the last few years; USB replacing parallel and serial ports, Serial ATA replacing parallel ATA and an overall move from wider, slower buses to faster, narrower buses. The reason for this is because serial buses can achieve higher frequencies and in the end, this translates to better bandwidth despite a smaller scale of parallelism.

RAMBUS started with 16-bit DDR memory running at 400MHz for the disastrous i820 chipset. Its performance-to-price ratio was horrific at first sight and resulted in universal bad press for RAMBUS. As if that wasn't bad enough, the company started launching lawsuits at just about every memory manufacturer for patent infringement. Although the lawsuits were soon dismissed, RAMBUS was soon hated – not just by the press but also by its own memory affiliates and potential fab partners. However, if we ignore the company's management and just concentrate on its RDRAM technology, we'll find that there's still merit to be given.

RDRAM in its present form (RIMM4200) has scaled successfully to 32-bit and is now clocked at 533MHz DDR. Despite the fact that real world performance has not scaled anywhere near linearly, this is a very impressive technological feat. The competition is left in the dust with a peak offering that is

only 60% of the bandwidth possible with RIMM4200, rare and expensive it may be. Due to lack of official support, RDRAM is unlikely to proliferate despite any theoretical performance advantages. RAMBUS as a company still has a lot of butt kissing left to do in the industry. Looking forward, its next generation 'Yellowstone' technology, which is scalable to 100GB/s, looks extremely promising.

### SLI meets DDR

Other than the two approaches we've discussed, another vendor is pushing a different way of achieving higher bandwidth. Founded in 1996, Kentron is seeking to reach DDR-II speeds by using existing DDR memory and its own custom controller chips. ST Microelectronics designed the controller chips, which act by delaying the second clock by a quarter of a cycle and then alternating between the data bits to generate twice the number of bits per cycle. The exact details of this haven't been made public as Quad-Band Memory is a proprietary technology and is not standardised with the JEDEC body. However, unlike RAMBUS, QBM is a royalty free technology and Kentron is not known to go around suing every DRAM manufacturer yet.

There are several advantages to QBM but in a sense, it is not a revolutionary technology. The essence of QBM is using existing technology to scale bandwidth. The memory interface and pin count is the same as DDR at 184. The capacitance loading is lower than DDR, making it possible to have more than two DIMM slots and still maintain stability. It is also built with DDR-II in mind, meaning when DDR-II comes into mass availability,

it will use the same techniques to produce double the bandwidth of DDR-II.

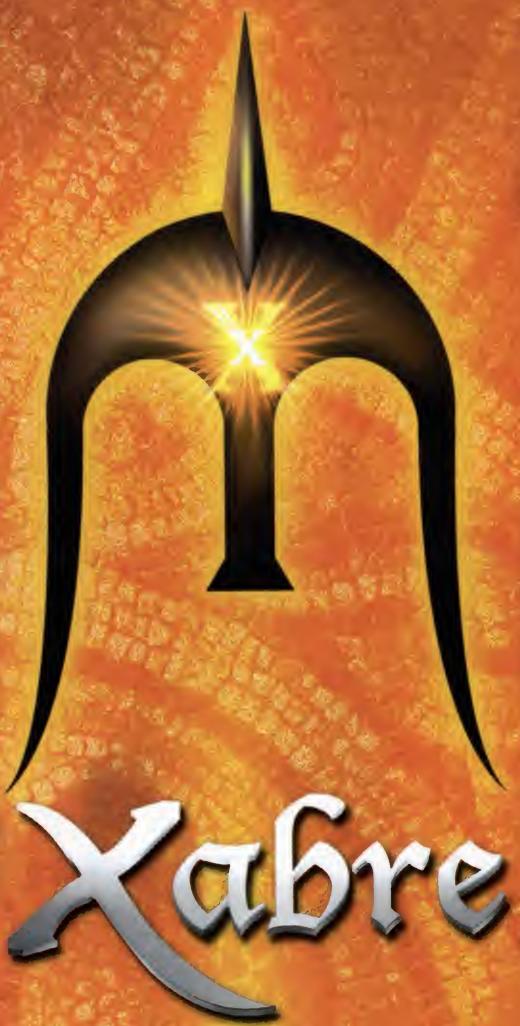
This seems very scalable and would appear to be always ahead of the competition but there is one big problem with Kentron and its push for QBM – execution. QBM was originally intended to do the same thing for SDRAM but that never materialised due to incomplete components. The new window is to splash in before DDR-II does. Currently, only VIA is known to be developing a chipset for QBM and no graphics vendor has jumped on board. Unless Kentron can execute on time this round (late 2002) with proper chipset support and availability, it may be forever playing a game of catch up without shipping a product.

### Coming back to reality

It is well known in the online community that stability goes down the tubes as more DIMM slots are populated on KT266 boards. It also happens that for the next few months, PC2700 memory will move into mainstream channels, although some lack proper certification. Be very careful, as two sticks of PC2700 DDR memory can seriously undermine your system stability. If you are buying motherboards, it would be prudent to avoid extra DIMM slots as a bonus feature as they are hardly usable.

In the coming years, DDR-II will most likely be accepted due to its backing from most major players. QBM has a chance to gain some acceptance if properly executed and RDRAM might survive in high-end machines and networking applications. Further down, Yellowstone looks to blow away anything in sight – don't be surprised if one day graphics memory carries the slanted 'R'. O

# Ascending New Visual Heights



## Xabre

*Leave competitors in the dust with Xabre's powerful 8X8 graphics capabilities and world domination may soon be yours*



Xabre's cutting-edge 8X8 graphics engine is a successful marriage between AGP8X and DirectX8.1 technologies.

The latest AGP8X interface resolves transmission bottlenecks between existing graphics chips and the North and Southbridge, while Microsoft's DirectX8.1 gives you greater image performance for gaming and 3D graphics emulation.

- 8X8 Full driving Power GPU   ● Pixelizer™ Engine   ● Frictionless Memory Control™ (FMC)
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- The Xminator™ XP Unified Driver   ● CubicLook™ Utility   ● Double Scene™ Technology

# P4 OVERCLOCKING DEATHMATCH

If you're ready to upgrade and you'll accept nothing less than the fastest and best quality board for your Pentium 4 then you'll need to dedicate some time to researching the options. How much time? We estimate it will take you about 15 minutes to read the results of John Gillooly's month-long examination of 14 contenders for the title of P4 DDR motherboard king. When you're done reading, you'll know what to do next.

In the *Atomic* Labs we have a sort of human excitement barometer in the form of Bennett. We measure just how hot a product is by the amount of nervous energy that he emanates when we mention it. At the moment the only thing that gets Bennett jiggling more than the RADEON 9700 PRO is the Pentium 4.

After a long wallow in the pools of average, the P4 has dragged itself out, had a quick wash and a haircut, and easily become the CPU of the moment. This is both due to the Northwood die shrink and subsequent FSB boosting as well as the insane overclockability of 100MHz FSB models. To accompany this metamorphosis there has been an explosion in the number and variety of chipsets on the market, and motherboard manufacturers are taking these chipsets and packing all sorts of extra goodness onto their boards in order to deliver the perfect home for a speedy CPU.

If you are looking at upgrading to a Pentium 4 keep this fact in mind though. Just as Intel killed the upgrade path when it shifted the original Socket 423 P4 design to the new Socket 478 one, and again when it introduced a 533MHz FSB that required new motherboards, the word on the street is that the 3GHz and above Pentium 4 models will require more power and may also include Hyperthreading support, both of which will require new chipset revisions and new motherboards. At least the disappearing RDRAM support means that your DDR333 RAM will still be widely supported in these new boards. DDR333 support will also feature in the next generation Dual-Channel DDR boards that the major chipset manufacturers are gearing to launch around the end of this year.

Later this year we will be seeing the focus shift back to the Athlon XP, as VIA and NVIDIA duke it out with the KT400 and nForce2 chipsets, and everyone waits with bated breath to see whether the Hammer is the revolution it has been made out to be. But for now the Pentium 4 is 'the shit' and with the launch of the 2.8GHz model Intel is holding all the speed (and price) cards.

## The challenge

Of course, a good CPU needs a good motherboard. So *Atomic* lay down a challenge to mobo manufacturers consisting of one very simple rule: send us one Pentium 4 DDR motherboard. That's right, no double-ups, no messing around with slight variants – just give us your best featured, most overclockable and plain fastest board, a board that an *Atomic* reader would love to use.

And that's what we have here. 14 of the contenders deemed most worthy by their makers. All boards have been tested using a 2.4B GHz P4 (533MHz FSB Northwood) and 512MB of the new Corsair XMS3200CL2 DDR RAM (kindly supplied by Altech [www.altech.com.au](http://www.altech.com.au)).

The XMS3200CL2 RAM has been used because it is validated to run at DDR400 speeds using the aggressive CAS 2 setting. (Although in practice the lack of a DDR400 standard means that the potential aggressiveness of memory timings will vary from chipset to chipset).

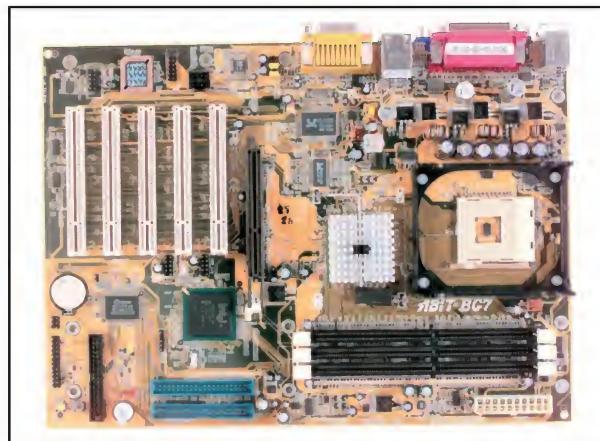
For overclocking tests we have used a 1.6A GHz P4 (400MHz FSB Northwood P4). We have also provided reference results using the 2.4B GHz P4 in an RIMM4200-supporting ASUS P4T533 mobo as RDRAM is still the fastest memory solution for the P4 (but only by a small margin).

For standard performance we tested with SYSmark2002 and Quake 3: Arena CPU settings, all with the motherboard set to its most aggressive stable settings. To test the overclocking features of the board we set an upper Vcore limit of 1.7V and cranked up the Front Side Bus of the 1.6A P4, seeing what the FSB could reach before the system fell over. For these tests we have reported the value used in the BIOS rather than the 'quad pumped' numbers that Intel uses ie. 100MHz rather than 400MHz, alongside the CPU speed attained.

Despite the ability of many of the boards to support V-core values higher than 1.7V we settled on this due to concerns with relatively short term damage occurring to the 0.13micron P4 Northwood core when it is supplied with more than 1.7V for a prolonged period of time. After all, overclocking is fun, but only if your new CPU lasts more than a few weeks.

There have been a few common themes. Despite not being validated for use with DDR333 all the boards in the roundup based upon the i845G chipset (except Intel's model) include support for RAM at that speed when you are running a 533FSB P4, hence the prevalence of this chipset in the roundup. The integrated graphics suck, but the AGP slot means that you need not bother yourself using them, and when it comes time to upgrade the integrated graphics will work fine when you are building your grandmother's new Net surfing box.

The SiS648 and VIA P4X400 chipsets both have problems running RAM at DDR400 speeds despite unofficial support, and we have found that the SiS648 IDE controller can be incredibly flaky at times, a problem that will hopefully be fixed as BIOS versions mature.



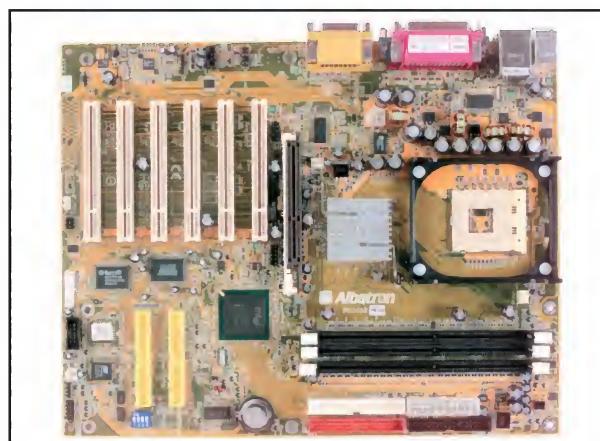
### ABIT BG7

**Specifications:** 845G chipset; USB 2.0; 10/100 Ethernet; onboard audio; three DIMM and five PCI slots; and DDR333 support.

**Maximum stable FSB:** 150MHz (2.4GHz) **Price:** TBA

**Website:** ABIT [www.abit.com.tw](http://www.abit.com.tw) **Supplier:** Synnex [www.synnex.com.au](http://www.synnex.com.au)

ABIT has built a reputation around tweaking and overclocking and the BG7 is no exception. Using the i845G chipset it happily supports DDR333 at the most aggressive settings. The BG7 is a relatively feature-free board, lacking ABIT's trademark RAID option, but supporting six channel onboard audio and onboard 10/100 Ethernet, both via Realtek chips. It also has a handy set of power and reset microswitches built into the board. What it lacks in features, it makes up for in stability and tweakability, sitting at the fast end of the benchmark results, and it's only let down by relatively low overclocking performance.



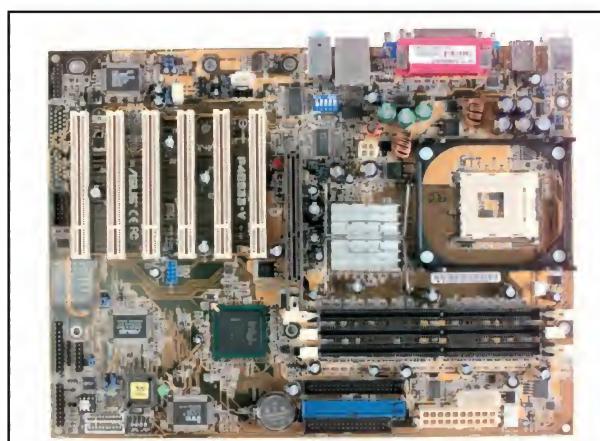
### Albatron PX845E Pro II

**Specifications:** i845E chipset; USB 2.0; 10/100 Ethernet; onboard audio; three DIMM and five PCI slots; and DDR333 support.

**Maximum stable FSB:** 163MHz (2.61GHz) **Price:** \$309

**Website:** Albatron [www.albatron.com.tw](http://www.albatron.com.tw) **Supplier:** QTD [www.qtd.com.au](http://www.qtd.com.au)

Newcomer to the motherboard market, Albatron, is firmly targeting tweakers and overclockers with its new board. The P4X845E proudly touts support for DDR400, however on closer inspection this is only achievable by running your FSB overclocked to 150MHz. It is more reasonable to see this as a board that will run DDR333, which it does happily. Overall this is a very overclocker-friendly entry, with comprehensive BIOS options. The PX845E Pro II also has the honour of running the 1.6A GHz P4 at an effective 652MHz FSB, the equal highest seen in the roundup.



### ASUS P4B533-V

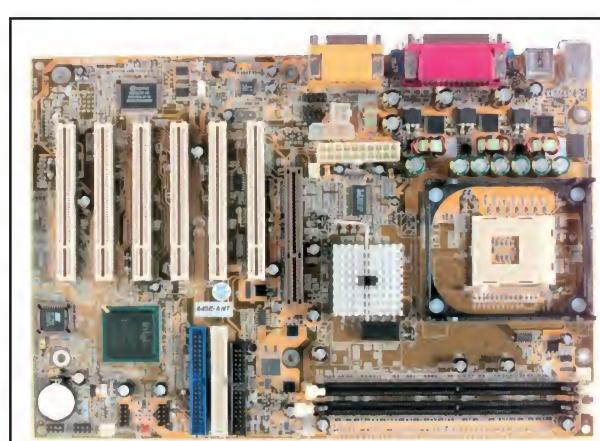
**Specifications:** 845G chipset; USB 2.0; 10/100 Ethernet; onboard audio; three DIMM and six PCI slots; DDR333; and ATX12V molex replacement.

**Maximum stable FSB:** 163MHz (2.61GHz) **Price:** \$359

**Website:** ASUS [www.asus.com.tw](http://www.asus.com.tw) **Supplier:** CASSA [www.cassa.com.au](http://www.cassa.com.au)



To tell the truth, we had become a little jaded by the board offerings from ASUS lately. While always sporting a decent feature set both on the board and in the BIOS, the ASUS boards we had seen were good but nothing earth shattering. However the P4B533-V surprised us with both features and its overclocking performance. It does lack some of the fancy extras seen on other boards, but it is a good, stable platform from which to run a P4 either at stock speeds or overclocked. ASUS has added DDR333 support and has also included a handy molex connector for those who lack ATX12V power supplies.



### AZZA 845E-ANT

**Specifications:** i845E chipset; USB 2.0; onboard audio; two DIMM and six PCI slots; and ATX12V molex replacement.

**Maximum stable FSB:** 133MHz (2.13GHz) **Price:** \$259

**Website:** AZZA [www.azza.com.tw](http://www.azza.com.tw) **Supplier:** AMI [www.ami-computers.com.au](http://www.ami-computers.com.au)

This motherboard from newcomer to the Australian market, AZZA, sits very much in the budget category. It is a product worthy of consideration but it lacks the bells and whistles that characterise the other members of this roundup. The board lacks tricked up DDR333 support, with DDR200 and DDR266 support only, and overclocking options are somewhat restrictive. On the plus side it features a molex plug for those without ATX12V connectors on their power supplies, and ships with versions of Mandrake Linux and Star Office.





### EPoX 4G4A+

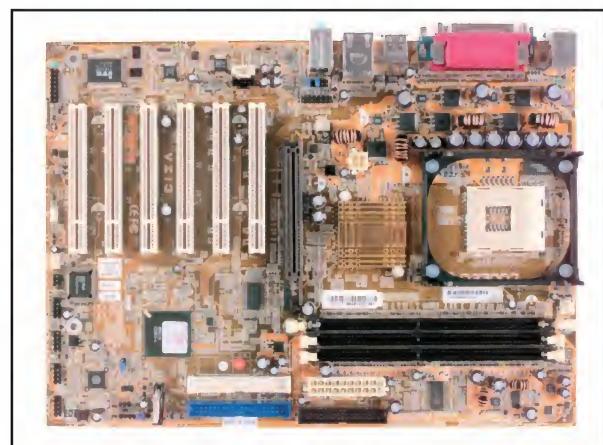
**Specifications:** 845G chipset; USB 2.0; 10/100 Ethernet; onboard audio; three DIMM and six PCI slots; DDR333 support; HPT372 IDE RAID.

**Maximum stable FSB:** 160MHz (2.56GHz) **Price:** \$279

**Website:** EPoX [www.epox.com](http://www.epox.com) **Supplier:** Westan [www.westan.com.au](http://www.westan.com.au)



EPoX is known for producing good tweaking boards at a very competitive price and the 4G4A+ continues this legacy. This DDR333-supporting i845G-based mobo sports a range of features such as IDE RAID and a LED POST readout. But the most stunning feature of the board is that it only needs normal ATX power, as it lacks the ATX12V connector that has been on every P4 board to enter the *Atomic* Labs. As the benchmark results show, this does not impact the board's performance at all. The board benches at the head of the pack, overclocks like a demon and is one of the finest choices of P4 boards in the roundup.



### FIC VI13

**Specifications:** SiS645DX; USB 2.0 and IEEE1394; 10/100 Ethernet; onboard audio; three DIMM and six PCI slots.

**Maximum stable FSB:** No FSB adjustment possible **Price:** \$200

**Website:** FIC [www.fic.com.tw](http://www.fic.com.tw) **Supplier:** FIC [www.fic.com.tw](http://www.fic.com.tw)

Using the now aging SiS645DX chipset, the FIC VI13 is very much a middle of the pack board. It runs well, benchmarks respectably and has a basic function set. Unfortunately this means that the board is outclassed when placed in such respectable company, falling well behind the tweaked up i845G boards. This is largely down to the SiS645DX chipset, which is a minor update to a chipset that first launched to rave reviews months and months ago (the DX purely indicates 533MHz FSB support), but it's still a lot more stable than the ultra-new SiS648 chipset.



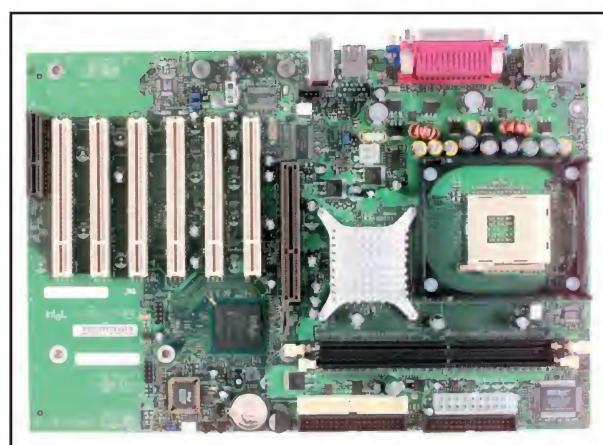
### Gigabyte GA-8IEX

**Specifications:** i845E chipset; USB 2.0; onboard audio; 10/100 Ethernet; three DIMM and six PCI slots; dual BIOS.

**Maximum stable FSB:** 162MHz (2.59GHz) **Price:** \$259

**Website:** Gigabyte [www.gigabyte.com.tw](http://www.gigabyte.com.tw) **Supplier:** Synnex [www.synnex.com.au](http://www.synnex.com.au)

Unfortunately, one of the overriding themes in this roundup is that the i845E lacks the grunt seen by other chipsets. Gigabyte's i845E offering, the GA-8IEX, suffers in benchmarks from this lacklustre performance, but makes up for it with some of the best overclocking performance in the roundup. This redeems the board, but unfortunately it ends up being eclipsed by other models that deliver good overclocking alongside fast unoverclocked performance. Yet again the GA-8IEX is a decent board from Gigabyte that just misses out on being a standout.



### Intel D85GBV

**Specifications:** i845G chipset; USB 2.0; 10/100 Ethernet; onboard audio; three DIMM and five PCI slots.

**Maximum stable FSB:** No FSB adjustment possible. **Price:** \$255

**Website:** Intel [www.intel.com](http://www.intel.com) **Supplier:** Synnex [www.synnex.com.au](http://www.synnex.com.au)

Intel may make the chipset, but its motherboards are targeted squarely at the reliability and stability needed for businesses. Because of this the Intel D85GBV fares poorly among the features and raw speed of such highly tweaked company, but its benchmark results show it kicking the butts of similarly spec'd boards. Unfortunately this board has zero overclocking options and very minimal tweaks (it is the only i845G board here that lacks DDR333 support), which mean that while it is a good option for the unadventurous, those looking to get the most from their P4 are advised to look elsewhere for their fix.





# AD77

## INFINITY



### VIA KT400 / Socket A / ATX

- VIA KT400 / 8235 chipsets
- AMD Athlon XP, Athlon, Duron CPUs
- 4 DDR400 / 333 / 266 DIMMs
- AGP8X/4X/2X slot
- 10/100 Mbit LAN
- 6 USB 2.0 ports / 6 channel audio
- Serial ATA or IDE RAID 0.1
- 1394 connectivity

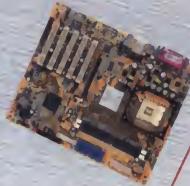
## Play with Performance



NB77

### Intel 845GE / Socket 478 / ATX

- Intel 845GE / ICH4 Chipsets
- 533 / 400MHz FSB Pentium 4 CPUs
- 2 DDR333 / 266 DIMMs
- Intel 266MHz Extreme Graphics & AGP4X slot
- Realtek RTL8100 LAN (option)
- 6 USB 2.0 ports / AC97 audio



NB78

### Intel 845PE / Socket 478 / ATX

- Intel 845PE / ICH4 Chipsets
- 533 / 400MHz FSB Pentium 4 CPUs
- 2 DDR333 / 266 DIMMs
- AGP4X
- Realtek RTL8100 LAN (option)
- 6 USB 2.0 ports / AC97 audio



NS80

### SiS 648 / Socket 478 / ATX

- SiS 648 / 963 chipsets
- 533 / 400MHz FSB Pentium 4 CPUs
- 3 DDR 333 / 266 DIMMs
- AGP8X /4X
- 10 / 100 Mbit LAN (option)
- 6 USB 2.0 ports audio
- 1394 connectivity (option)



BitGuard is a hardware monitoring system designed for DFI boards: diagnostic LEDs, Overclock AP, Watch Dog, CPU, AGP, fan and thermal protection.



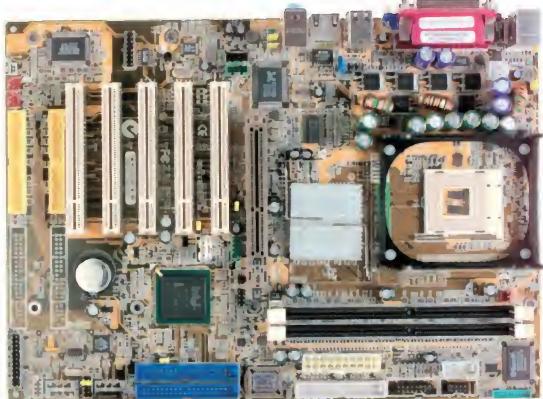
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### Iwill P4GS

**Specifications:** 845G chipset; USB 2.0; 10/100 Ethernet; onboard audio; two DIMM and five PCI slots; DDR333; and one S-ATA connector.

**Maximum stable FSB:** 132MHz (2.11GHz) **Price:** TBA

**Website:** Iwill [www.iwill.net](http://www.iwill.net) **Supplier:** Com1 [www.com1.com.au](http://www.com1.com.au)

Iwill has done a great job with its i845G chipset, with one major caveat. On the plus side the board supports ATA133 RAID and also hosts one S-ATA port, and like the majority of i845G-based mobos the board supports DDR333. However it falls over in overclocking options. While it happily supports upping voltage to the PS2 port, there is no option to up the Vcore. And to make things worse, the maximum FSB overclock for a 400MHz FSB P4 is 528MHz, where most boards have at least a jumper to switch the 'default' FSB to 533MHz, hopefully this can be fixed by a BIOS update from Iwill. Close but no cigar.



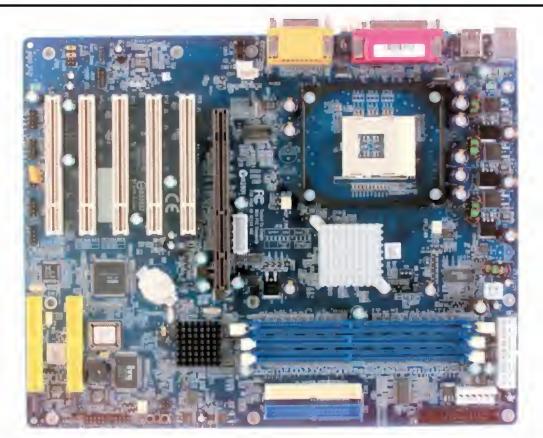
### MSI 648 Max

**Specifications:** SiS648 chipset; USB 2.0; Gigabit Ethernet; onboard audio; three DIMM and six PCI slots; unofficial DDR400 support; and AGP 8x.

**Maximum stable FSB:** 150MHz (2.4GHz) **Price:** \$285

**Website:** MSI [www.msi.com.tw](http://www.msi.com.tw) **Supplier:** MSI [www.msicomputer.com.au](http://www.msicomputer.com.au)

With the 648 MAX, MSI has taken the new SiS 648 chipset and added extra features such as onboard Gigabit Ethernet via a Broadcom controller and several extra USB ports. Unfortunately, despite the most extensive range of CPU/RAM speed dividers we have ever seen, the board has major problems running RAM at DDR400 speeds and instead must be happy with DDR333 speeds, at which it performs well but still lags behind i845G boards. MSI has delivered a decent performer with good features, and will definitely appeal to a large number of end users because of this. Just don't get too adventurous with your tweaking.



### Shuttle AS45GT/R

**Specifications:** SiS648 chipset; USB 2.0; IEEE1934; onboard audio; three DIMM and five PCI slots; DDR400; AGP 8x; two S-ATA connectors.

**Maximum stable FSB:** 150MHz (2.4GHz) **Price:** \$230

**Website:** Shuttle [www.spacewalker.com](http://www.spacewalker.com) **Supplier:** Sato [www.satotech.com.au](http://www.satotech.com.au)

The AS45GT/R is a feature rich offering from the newly improved Shuttle: using the SiS648 chipset to support USB 2.0, AGP 8x and IEEE1394, it also sports two S-ATA ports alongside a Highpoint IDE RAID controller. It has a molex plug for non-ATX12V power supplies as well as power and reset microswitches. A special mention has to go to the board's ability to increase the Vcore all the way up to the insane level of 2.4V. Unfortunately it suffers from the mildly flaky SiS648 behaviour, which keeps it from being the performance star, but it does have a solid range of features.

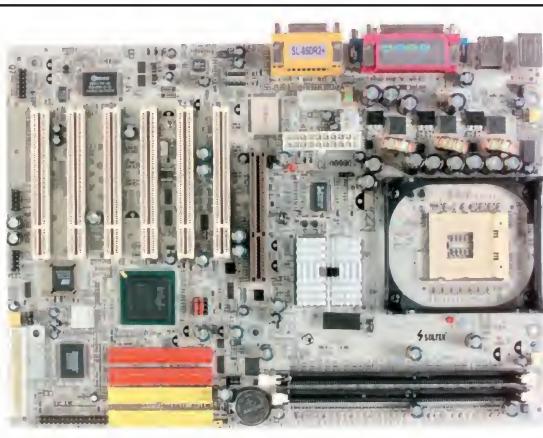
### Soltek SL-85DR2

**Specifications:** i845E chipset; USB 2.0; onboard audio; two DIMM and six PCI slots; and ATX12V molex replacement.

**Maximum stable FSB:** 155MHz (2.48GHz) **Price:** \$220

**Website:** Soltek [www.soltek.com.tw](http://www.soltek.com.tw) **Supplier:** Altech [www.altech.com.au](http://www.altech.com.au)

Soltek's metallic PCB has become a great source of debate in the *Atomic* Labs. Some say it is silver while most of us concur that the colour is more a dull grey. This PCB is the biggest feature of the SL-85DR2, as the board performs well but lacks the edge seen with other boards in the roundup. The inclusion of IDE RAID is a bonus, but there is nothing too exciting about the board. It does include Soltek's Red Storm overclocking tools, however, as usual this fails to work properly, overclocking the FSB by a fraction of what the 1.6A is capable of, and pushing us back to overclocking by more traditional means.



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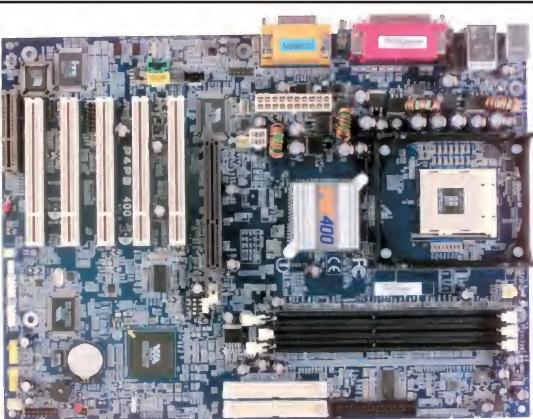
### Tyan Trinity i845E

**Specifications:** i845E chipset; USB 2.0; onboard audio; two DIMM and six PCI slots; and IDE RAID

**Maximum stable FSB:** 149MHz (2.38GHz) **Price:** \$402

**Website:** Tyan [www.tyan.com.tw](http://www.tyan.com.tw) **Supplier:** Digidcor [www.digidcor.com.au](http://www.digidcor.com.au)

Tyan has a great reputation for building solid, stable motherboards, with a strong legacy in the server market, and the Trinity i845E is no exception. While it is one of the slowest boards in the roundup, it is a good option for those who aren't worried about bleeding-edge performance. In fact, this board could do with some more overclocking options, as we were able to run the 1.6A GHz P4 at the maximum supported FSB of 149MHz with nary a problem. The board also lacks the unofficial support for DDR333 that is seen on other boards using Intel's chipsets.



### VIA P4B400

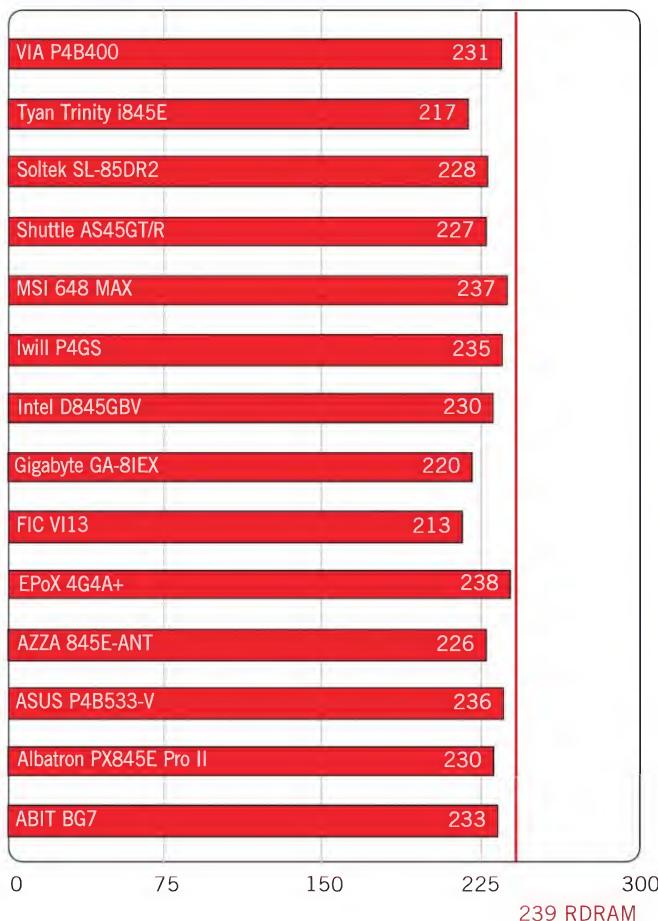
**Specifications:** VIA P4X400; USB 2.0; onboard audio; 10/100 Ethernet; three DIMM and five PCI slots.

**Maximum stable FSB:** 150MHz (2.40GHz) **Price:** \$299

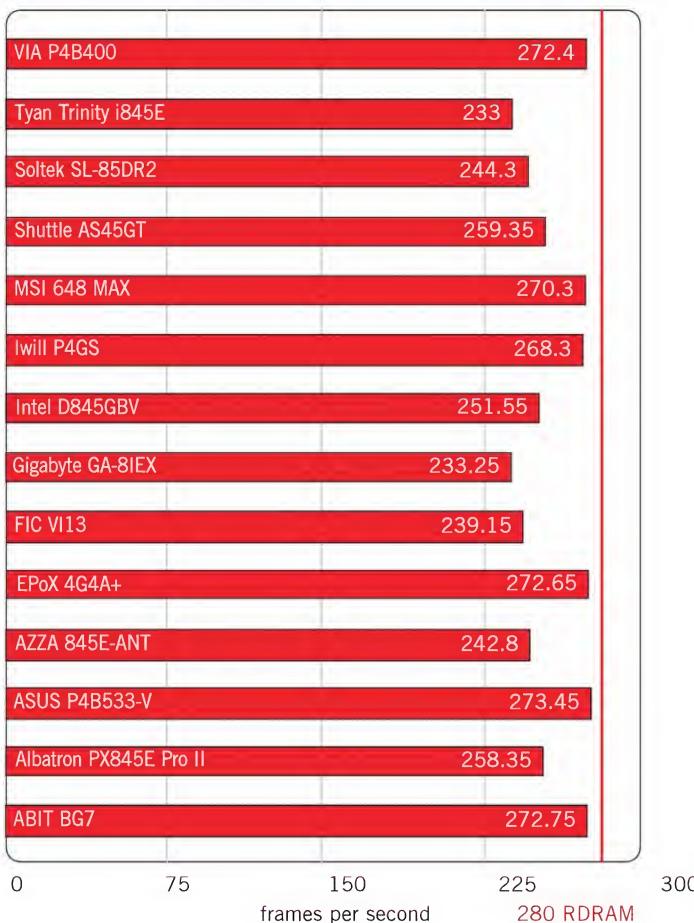
**Website:** VIA [www.viatech.com](http://www.viatech.com) **Supplier:** BCN [www.bcntech.com.au](http://www.bcntech.com.au)

VIA got us all excited when the P4X333 chipset was released. It was a chipset that didn't actually end up coming to market, instead it was replaced by the P4X400. Unfortunately this model designation does not indicate full support for DDR400 like one would assume, as the board fails to work well with DDR400, but is stable and fast with DDR333. VIA has produced a well-featured and impressive performer, yet it pales when compared to DDR333 supporting i845G boards. On the plus side the board does have next generation features like AGP 8x and support for IEEE1394 via mobo headers.

### SYSmark2002 – SYSmark rating



### Quake 3: Arena – CPU





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## 'Run with DDR333 and the CPU must use the 533MHz FSB, either by default or through the magic of overclocked low speed 'A' Northwood variants.'

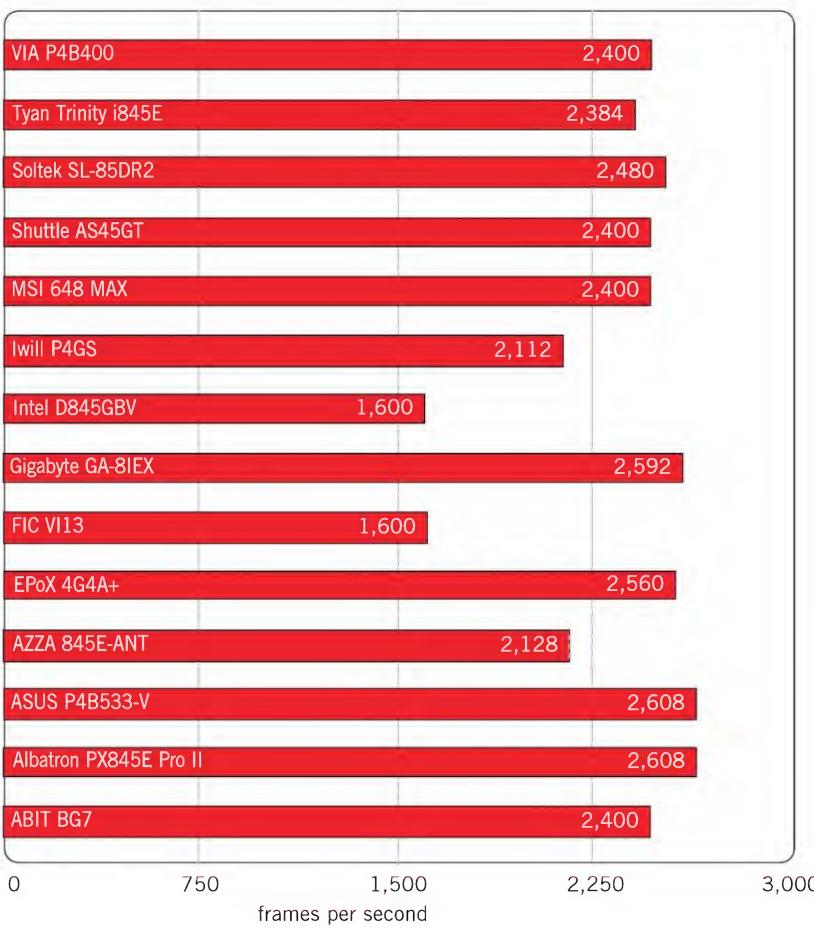
Thanks to the wide range of chipsets present in the roundup there is a fair spread of results. While none of the boards would qualify as being slow, there are some noticeable differences between boards based on various chipsets. Without a doubt the overall winner of the Roundup is the i845G chipset. The seeming ease with which mobo manufacturers can add support for DDR333 running stably at full speed puts the other chipsets to shame, of course the big thing you need to remember if you want to run one of these boards with DDR333 is that the CPU must be using the 533MHz FSB, either by default or through the magic of overclocked low speed 'A' Northwood variants. If you are running a 400MHz FSB then the boards will only support DDR266.

Out of these i845G boards the two that stand out are the ASUS P4B533-V and the EPoX 4G4A+. These manage to

combine phenomenal standard performance with comprehensive overclocking and tweaking features.

Honourable mentions also go to the Shuttle AS45GTR, which wins in the feature stakes but is hobbled by the inability of the SiS648 chipset to run with the RAM as aggressively as the i845G boards, and Intel, which has managed to obtain amazing performance from its own chipset and demonstrate the best DDR266 scores in the roundup.

There are amazing Pentium 4 motherboard options out there, but it is a pity that the more stable boards lack the amazing feature sets of the newer generation, which unfortunately lack the stability of the Intel chipsets. Over the next few months the focus will shift back towards the Athlon with the release of the KT400 and the nForce2 chipsets, but for now there are some kick-ass options for the Pentium 4.

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REVIEW

# REVIEWS >>>

## Standards are for newbies

This month brings forth several new chipsets, accompanying feature sets and a George Dubya-load of inherent problems. John Gillooly ain't going to take it anymore.



One of the most satisfying experiences in the *Atomic* Labs (apart from turning OFF *The Best of David Lee Roth* when our Semi-Evil admin, Chris, leaves the room) is putting together a testbench from the latest and greatest hardware, shorting the power jumpers and watching the whole thing work.

No beeps, no garbled screens, no tinny American voice saying 'your memory has a... problem' over and over again, just sweet, sweet bootage.

The past month has been decidedly unsatisfying in that regard with all matter of glitches, incompatibilities and just plain crappy hardware interactions plaguing the new generation of cutting edge hardware.

From these silicon conspirators against my sanity I have managed to narrow down a hit list of hardware – hardware that better not meet me in a dark alley anytime soon. At the top of my list sits so-called DDR400 RAM. This non-standard has brought back the early issues experienced with DDR333 and amplified them beyond the point of annoying and straight into the realm of hair-tearingly frustrating.

As I write this the situation, as I understand it, is this: the VIA KT400 chipset will support DDR400, but only a single DIMM thereof. It will support DDR333 happily and have no problems dealing with DDR266. My experience with the SiS648 chipset shows a similar picture emerging.

The problem is that the DDR333 RAM of choice, Corsair's XMS3200, may be rated to run at 400MHz effective, and in the latest version it will do this with a CAS latency of 2, but this does not necessarily mean that it works at that speed in DDR400-supporting motherboards.

The Samsung chips used in the Corsair RAM may be the best DDR333 on the face of the planet but they apparently have major problems with

DDR400 boards and whatever draft standard the chipset manufacturers are crowing about at the time. KingMax has DDR400 RAM but it too uses the Samsung chips and hence has the same sort of problems.

As an alternative it was suggested to me that DDR400 RAM using Winbond chips is the way to go, but so far I have had similar, though somewhat milder, problems when using Winbond-based Adata DDR400.

It is currently a compatibility nightmare of monumental proportions and I fully expect to see chipset and motherboard manufacturers posting up compatibility lists on their Websites sometime soon.

For now, I would recommend sticking with DDR333. Now that it has become a ratified standard the teething problems are ironed out and there are great options available, and as our Pentium 4 Motherboard showdown demonstrates, DDR333 is currently delivering performance for the Pentium 4 that almost rivals the expensive and esoteric PC1066/RIMM4200 variants of RDRAM. For the Athlon and its 266MHz effective FSB DDR333 still makes fruck all difference to performance. But rumours abound that AMD will soon move to a 333MHz effective FSB (something supported by the VIA KT400 and NVIDIA nForce2 chipsets), which will mean that the Athlon will be able to take advantage of the bandwidth offered by DDR333.

I'll keep you posted on the DDR400 situation, but for now I would suggest that you stay clear of that pathetic psuedostandard entirely.

My second major hardware gripe this month is with AGP 8x, or more specifically SiS' version thereof.

It seems that in the rush to launch the 'world's first 8x8' chipset SiS neglected to ensure that the Xabre would run at 8x AGP on chipsets other

than those made by SiS. The current situation is that the Xabre won't run at 8x AGP on VIA mobos and it remains to be seen how it fares on the nForce2 and Intel's eventual 8x AGP boards.

The RADEON 9700, on the other hand, does not suffer from a vested interest in motherboard chipsets (the penetration of ATI's core logic chipset has been zero so far) and hence should support the proper AGP 8x specification and work on all the boards.

Similarly, we should expect that the soon-to-be-released refresh of the GeForce4 MX and GeForce4 Ti, codenamed NV18 and NV28 respectively, will support the proper specifications as NVIDIA has learned the hard way that it is still only a very small fish in the core logic chipset pool.

This is somewhat of a moot point considering that the expected performance gains delivered by AGP will be negligible except in some very specific cases, and a card like the Xabre will probably never actually need the full AGP 8x bandwidth. But it is a fancy number for OEMs to put in their system advertisements, and that will probably be the main area in which AGP 8x is pushed.

It is certainly a frustrating time to be dealing with the latest generation of hardware. Let us just hope that this will be the inevitable teething phase that paves the way for smooth sailing into the next generation of chipsets, and that when AMD's Hammer and Intel's 3GHz Hyperthreaded part are launched upon the public the fundamental motherboard issues are sorted.

In the meantime DDR400- and SiS-flavoured AGP 8x better look out, especially when walking home at night, because I am on the lookout for them and I now have some serious scores to settle... and I ain't thinking rationally on the matter anymore. Either that or I just need a good lie down. □



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# Atomic Benchmarks

The way we do the things we do.

Here at *Atomic* it is our primary intention to give you the final word on the latest in hardware and PC technology. An integral part of determining the performance of a particular piece of hardware is benchmarking, and this is something that we take very seriously in the *Atomic* Labs.

## SYSmark2002

SYSmark is a product of the collaboration between industry group BAPCo ([www.bapco.com](http://www.bapco.com)) and MadOnion.com ([www.madonion.com](http://www.madonion.com)). It is one of the next-generation application benchmarks and is designed to more accurately replicate the day-to-day workload that a system is subjected to. The benchmark focuses on Internet Content Creation and Office Productivity tasks in order to generate a final rating.

## SiSoftware Sandra 2002 Professional

Sandra, from SiSoftware ([www.sisoftware.co.uk](http://www.sisoftware.co.uk)), is a comprehensive benchmark and diagnostics utility. It contains dozens of special module applets that retrieve detailed information about the specifications and settings of a system, by polling each component's built-in firmware or BIOS. Sandra also features

a small suite of synthetic benchmarks for specific components such as CPU, memory, CD-ROM and hard disk. It also features a burn-in wizard for stress-testing overclocked systems.

## 3DMark2001SE Pro

3DMark2001SE Pro from MadOnion.com is the next progression of the popular benchmark utility. It also uses the MAX-FX engine and heavily emphasises DirectX 8.1 functions, including programmable shaders. The results are not comparable with results from 3DMark2000 Pro.

## Serious Sam: SE

Serious Sam: The Second Encounter is used for testing OpenGL performance. For game tests we use the Cooperative demo, which outputs an average framerate trimmed of excessive peaks. It also contains a fillrate test, which outputs fillrates for various texturing methods and is useful for comparisons between video chipsets.

## HSF testing

To test HSFs, we use our Athlon XP test bed, which uses an internal temperature diode. SiSoft Sandra 2002 is run in looping burn in mode, with both CPU tests selected for 30 minutes before the load temperature is



The *Atomic* HOT award is given only to the most kickarse products to hit the labs, ones that score 9 or greater. The ones we'd want.

recorded. The CPU is then left to idle for 30 minutes before the idle temperature is taken.

## Quake 3: Arena *AtomicMPC* Demo

Quake 3: Arena (Q3A), from id Software, is the very popular first person shooter representing widely used OpenGL gaming technology. Q3A has a built-in benchmarking utility and built-in demos that can test graphics card performance. These demos are fairly simplistic, and are not representative of the worst conditions that the game can offer to a graphics card. So we developed our own *AtomicMPC* Demo that pushes the hardware as far as possible.

## Other benchmarks

Sometimes we need to break down the tests into more specific areas, such as hard disk performance, memory performance or a particular facet of 3D like T&L. For these specific purposes we can draw on a vast number of applications, games and dedicated benchmarks such as CD Speed 99, DisplayMate, Dronez, MDK2, or Adaptec ThreadMark. We also use a Lian Li temperature probe from Anyware ([www.anyware.com.au](http://www.anyware.com.au)) for tests that involve the measurement of temperatures, such as HD heatsinks. ◻

## Atomic testbench specs

- AMD Athlon XP 1800+ system – ASUS A7V266-E motherboard (supplied by CASSA: [www.cassa.com.au](http://www.cassa.com.au))
- Intel Pentium 4 2GHz – ABIT BD7II-RAID motherboard (supplied by ABIT: [www.abit.com.tw](http://www.abit.com.tw))

### Common components

- Samsung 256MB PC2700 DDR RAM (supplied by CASSA)
- Samsung 256MB PC800 RDRAM (supplied by CASSA)
- Hercules Prophet II GTS 32MB (supplied by Guillemot: <http://au.hercules.com>)
- 20GB Ultra DMA/100 7,200rpm hard disk drive
- Hercules Prophet II GTS 32MB (Supplied by Guillemot: [www.hercules.com](http://www.hercules.com))
- Sound Blaster Live! Player (Supplied by Creative Labs Australia: [www.creatf.com](http://www.creatf.com))
- ASUS 52X CD-ROM (supplied by CASSA)
- Belkin PCI FireWire card (supplied by Belkin: [www.belkin.com.au](http://www.belkin.com.au))
- Belkin PCI USB 2.0 card (supplied by Belkin)

## Benchmark settings

### 3DMark2001SE Pro

- 1,024 x 768, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer
- 1,024 x 768, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer
- 1,600 x 1,200, 16-bit colour, 16-bit textures, 16-bit Z-buffer, triple frame buffer
- 1,600 x 1,200, 32-bit colour, 32-bit textures, 24-bit Z-buffer, triple frame buffer

### Quake 3: Arena *AtomicMPC* Demo

All tests use Quake 3 1.27g and our custom Q3A demo recorded by the *Atomic* staff

- CPU testing: 320 x 240, maximum geometry detail, minimum graphics settings, high sound quality
- Graphics cards: Low quality = 1,024 x 768, normal quality graphics settings, sound disabled
- Medium = 1,280 x 1,024, maximum graphics settings, with all game sound disabled
- High = 1,600 x 1,200, maximum graphics settings, sound disabled

# COOLJAG

# CPU

# COOLERS

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**CPU Cooler JAC304C**

Application: Socket 370, A / 462  
Intel 1.4ghz, AMD XP2300+

**Specification**

Weight: 350g  
Dimensions: 63.1 x 62.2W x 32.7H(mm)

**DC FAN**

Dimension: 60Lx 60Wx10H(mm)  
Rated Voltage: 12V DC  
Speed: 5300±10%RPM  
Bearing System: One Ball Bearing  
Safety Approvals(Standard):CE;AU

**Heatsink**

Material: Copper C1020  
Fin pitch: 1.8(mm)  
Fin thickness: 0.5(mm)

**Clip**

Material: Steel SK7 / Nickel Plate

**CPU Cooler JAC103C**

Application: Socket 370, A / 462  
Intel 1.4ghz, AMD XP2300+

**Specification**

Weight: 533 g  
Dimension: 72.5L x 62.4W x 63.6H(mm)

**DC FAN**

Dimension: 60Lx 60Wx25H(mm)  
Rated Voltage: 12 V DC  
Speed: 7000;010%RPM  
Bearing System: Two Ball Bearing  
Safety Approvals(Standard):CE;AU

**Heatsink**

Material: Copper C1020  
Fin pitch: 1.2(mm)  
Fin thickness: 0.45(mm)

**Clip**

Material: Steel SK7 / Nickel Plate

**CPU Cooler JAC565C**

Application: P4 Socket 478  
Intel P4 2.4ghz

**Specification**

Weight: 606 g  
Dimension: 89.5L x 72W x 55.5H(mm)

**DC FAN**

Dimension: 70L x70 W x 25H(mm)  
Rated Voltage: 12 V DC  
Speed: 6000±10%RPM  
Bearing System: One Ball Bearing  
Safety Approvals(Standard):CE;AU

**Heatsink**

Material: Copper C1020  
Fin pitch: 1.7(mm)  
Fin thickness: -0.5 -(mm)

**Clip**

Refer the drawing

**CPU Cooler JAC313C**

Application: Socket 370, A / 462  
Intel 1.4ghz, AMD XP1900+

**Specification**

Weight: 252 g  
Dimensions: 62.4L x 62 W x 25.3 H(mm)

**DC FAN**

Dimension: 60L x 60W x 10H(mm)  
Rated Voltage: 12 V DC  
Speed: 5300±10%RPM  
Bearing System: One Ball Bearing  
Safety Approvals(Standard): CE;AU

**Heatsink**

Material: Copper C1020  
Fin pitch: 1.3(mm)  
Fin thickness: -0.5 -(mm)

**Clip**

Material: Steel SK7/Nickel Plate

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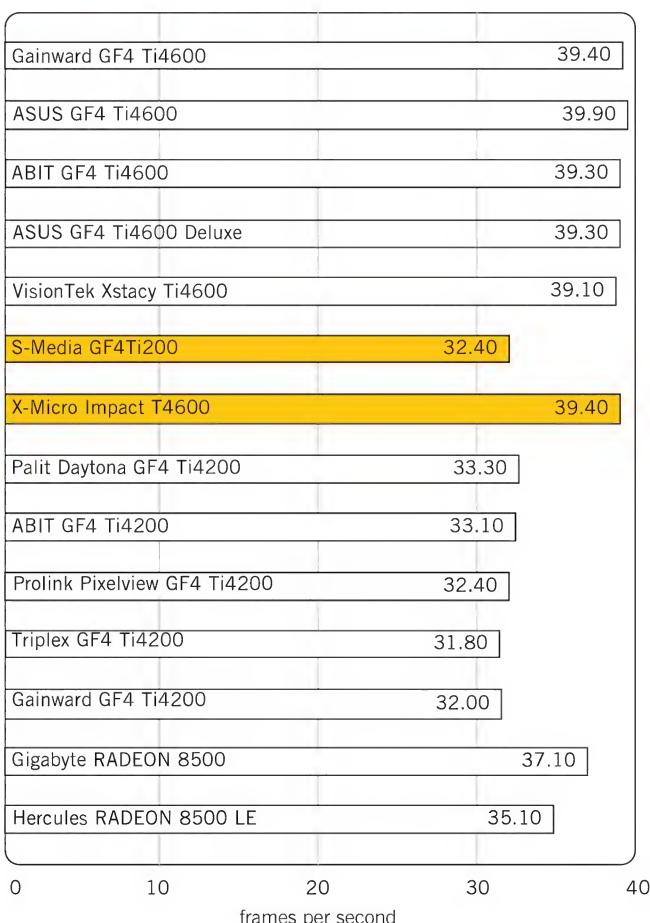
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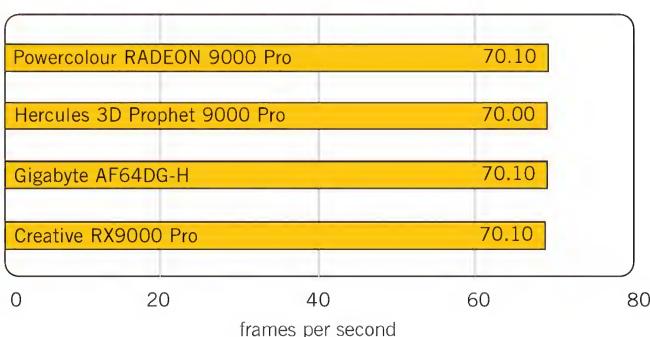
# Framerate

This month will be forever known as the month of the RADEON 9000. ATI is finally seeing the fruits of its move to the OEM market, with big names like Hercules and Creative getting in on the RADEON 9000 loving. In the next month or two the big brother RADEON 9700 PRO will hit the market, but for now the action is in the budget end.

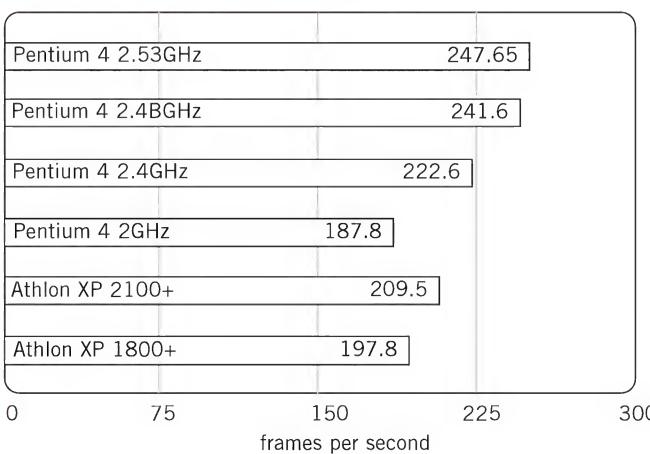
	<p><b>S-Media GF44200-D64DV</b></p> <p><b>Specifications:</b> NVIDIA GeForce4 Ti4200; 64MB DDR RAM; TV Out, D-Sub  <b>Core speed:</b> 250MHz <b>Memory speed:</b> 500MHz  <b>Website:</b> S-Media <a href="http://www.s-media.com.tw">www.s-media.com.tw</a>  <b>Supplier:</b> Blue Chip IT <a href="http://www.bluechipit.com.au">www.bluechipit.com.au</a>  <b>Price:</b> \$399</p>
	<p><b>X-Micro Impact T4600</b></p> <p><b>Specifications:</b> NVIDIA GeForce4 Ti4600; 128MB DDR RAM; TV Out, D-Sub  <b>Core speed:</b> 300MHz <b>Memory speed:</b> 600MHz  <b>Website:</b> X-Micro <a href="http://www.x-micro.com">www.x-micro.com</a>  <b>Supplier:</b> Altech <a href="http://www.altech.com.au">www.altech.com.au</a>  <b>Price:</b> \$680</p>
	<p><b>Gigabyte AF64DG-H</b></p> <p><b>Specifications:</b> ATI RADEON 9000 Pro; 64MB DDR RAM; dual 400MHz RAMDACs  <b>Core speed:</b> 275MHz <b>Memory speed:</b> 550MHz  <b>Website:</b> Gigabyte <a href="http://www.gigabyte.com.tw">www.gigabyte.com.tw</a>  <b>Supplier:</b> synnex <a href="http://www.synnex.com.au">www.synnex.com.au</a>  <b>Price:</b> \$239</p>
	<p><b>Creative 3D Blaster 5 RX9000 Pro</b></p> <p><b>Specifications:</b> ATI RADEON 9000 Pro; 64MB DDR RAM; dual 400MHz RAMDACs  <b>Core speed:</b> 275MHz <b>Memory speed:</b> 550MHz  <b>Website:</b> Creative <a href="http://australia.creative.com">australia.creative.com</a>  <b>Supplier:</b> Creative <a href="http://australia.creative.com">australia.creative.com</a>  <b>Price:</b> \$349</p>
	<p><b>Hercules 3D Prophet 9000 Pro 128MB</b></p> <p><b>Specifications:</b> ATI RADEON 9000 Pro; 128MB DDR RAM; dual 400MHz RAMDACs  <b>Core speed:</b> 275MHz <b>Memory speed:</b> 550MHz  <b>Website:</b> Hercules <a href="http://au.hercules.com">au.hercules.com</a>  <b>Supplier:</b> Hercules <a href="http://au.hercules.com">au.hercules.com</a>  <b>Price:</b> \$429</p>
	<p><b>Powercolor Evil Commando RADEON 9000 Pro</b></p> <p><b>Specifications:</b> ATI RADEON 9000 Pro; 64MB DDR RAM; dual 400MHz RAMDACs  <b>Core speed:</b> 275MHz <b>Memory speed:</b> 550MHz  <b>Website:</b> Powercolor <a href="http://www.powercolor.com.tw">www.powercolor.com.tw</a>  <b>Supplier:</b> Australia IT <a href="http://www.australiait.com.au">www.australiait.com.au</a>  <b>Price:</b> TBA</p>

**Serious Sam SE – 1,280 x 1,024 – quality**

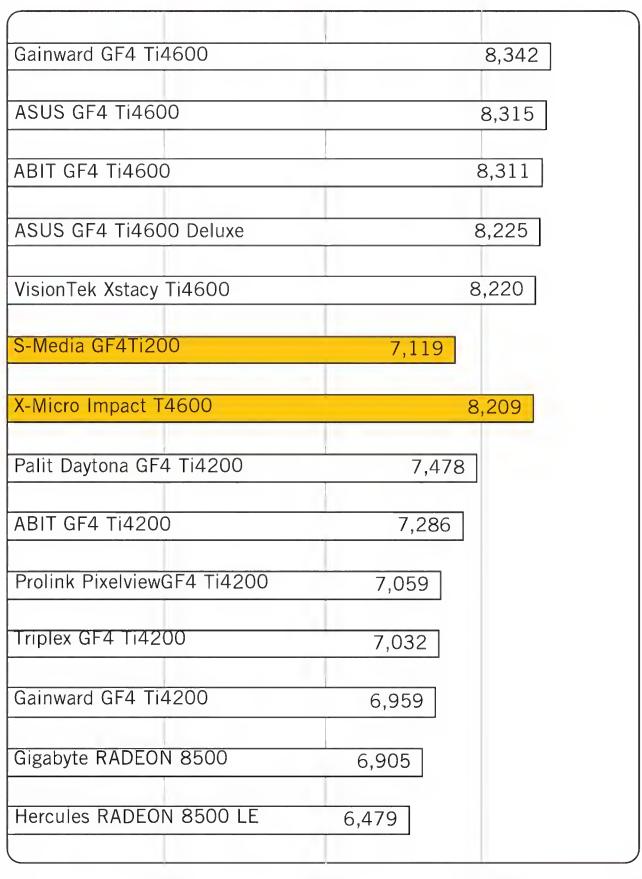
0      10      20      30      40  
frames per second

**Serious Sam SE – 1,024 x 768 – normal**

0      20      40      60      80  
frames per second

**Quake 3: Arena – CPU settings**

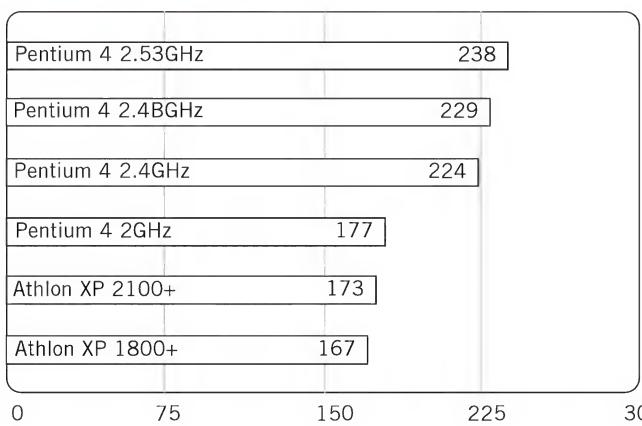
0      75      150      225      300  
frames per second

**3DMark2001 SE – 1,280 x 1,024**

0      2,500      5,000      7,500      10,000

**3DMark2001 SE – 1,024 x 768**

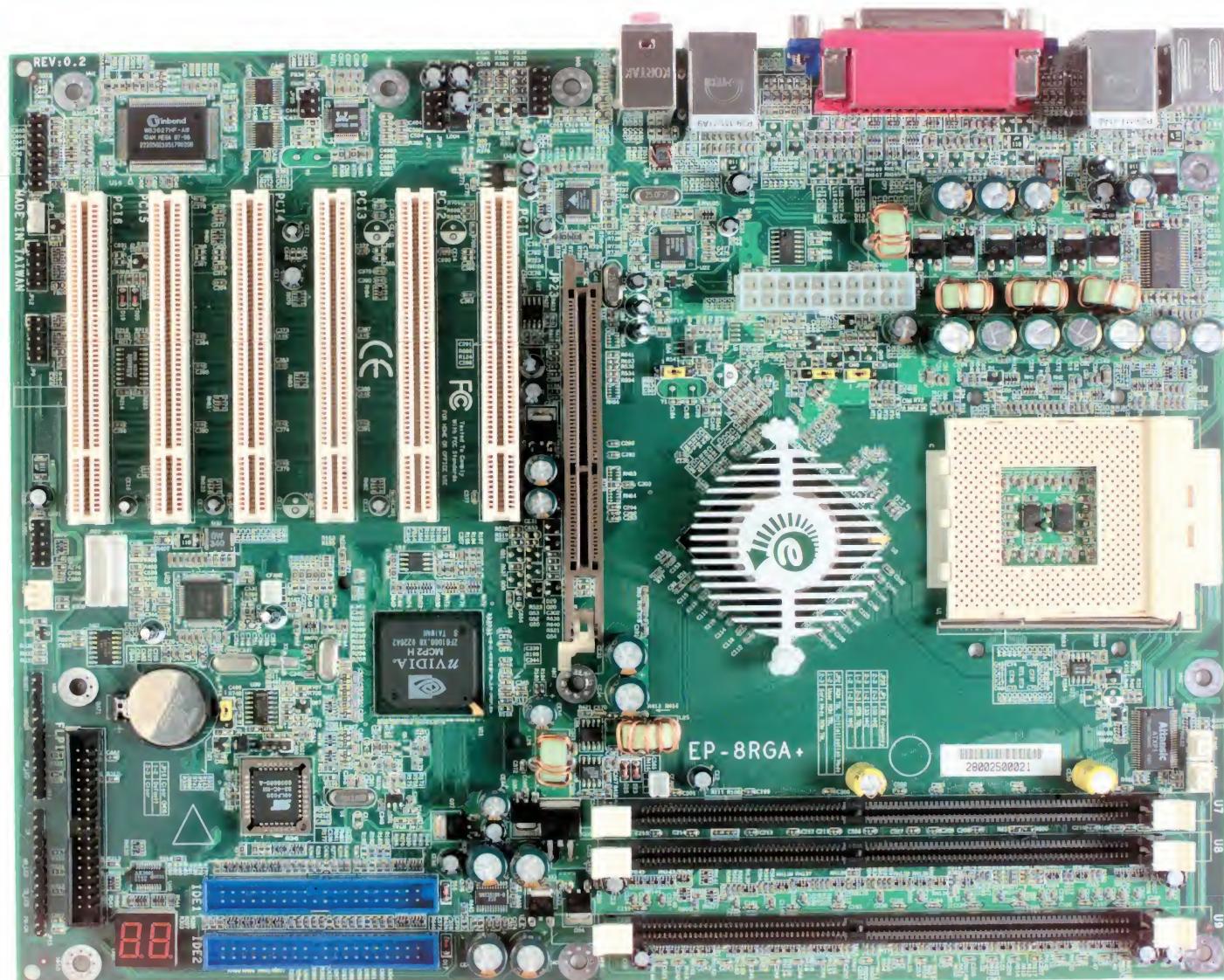
0      2,000      4,000      6,000      8,000

**SYSmack2002 – rating**

0      75      150      225      300

# EPoX 8RGA+ Preview

Can NVIDIA erase the mistakes made by nForce? John Gillooly hopes so.



When NVIDIA first announced its move into the motherboard chipset market in a hail of marketing speak everyone was expecting a revolution. When it actually delivered the chipset many, many months later the revolution turned out to be more like a bunch of student activists jumping up and down and shouting witty slogans.

For the first time in years NVIDIA had become a victim of timing, delivering nForce after VIA had finally gotten the DDR thing right and launched the KT266A chipset. There were other reasons of course: the integrated GeForce2 MX was quick but it was a chipset teetering on the end of its lifespan as a performance solution; and the TwinBank DDR controller showed performance benefits only when the integrated GF2 MX was in use and only a handful of motherboard manufacturers actually ended up bothering with the chipset.

NVIDIA is not known for running home crying to mummy, so it predictably kicked its R&D department into gear, updated the chipset, got more manufacturers behind

it, rejigged its marketing speak and prepared the next generation of nForce, the nForce2.

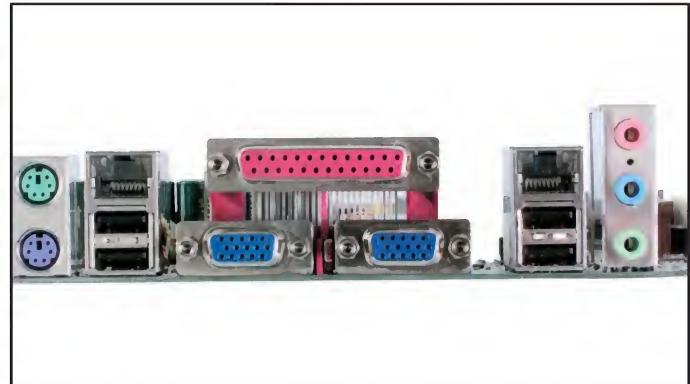
Thanks to EPoX, we managed to get our hands on an engineering sample of its nForce2 board, the 8RGA+. Unfortunately the early chipset revision (the IGP aka Northbridge is still marked with the Crush 18 codename) means that the board is still too unstable to benchmark reliably, thus making this a preview rather than a proper review, but it has given us a chance to see what features NVIDIA is offering and what changes they have made since nForce.

Conceptually speaking, the nForce can be seen as designed with the 'bigger is better' philosophy while the nForce2 is based upon 'two heads are better than one'. The 8RGA+ has dual monitor outputs, dual Ethernet ports and the rejigged DualDDR memory controller.

After the less-than-impressive performance of the nForce's TwinBank controller, NVIDIA has gone back to the drawing board (and marketing boardroom) to create



ABOVE: The nForce2 IGP features a built-in GeForce4 MX level graphics core



ABOVE: Dual display and dual Ethernet are big features of the nForce2

## 'Conceptually speaking, the nForce can be seen as designed with the bigger is better philosophy while the nForce2 is based upon two heads are better than one.'

DualDDR. Drawing upon the experience of asynchronous memory and core clocks in the video chipset world, NVIDIA's white papers declare that the memory and CPU clocks are truly asynchronous, allowing decent performance to be obtained from DDR333 and DDR400 and even from mismatched RAM.

DualDDR still consists of two independent 64-bit DDR controllers but some serious work has been done on the load balancing issues that prevented TwinBank from making a major impact.

The IGP (Integrated Graphics Processor) features an integrated GeForce4 MX, which is a capable solution and should again be the fastest integrated core on the market. Like the normal GeForce4 MX it will only support DirectX 7 functions, but it should be fine for the casual gamer. One interesting aspect of the nForce2 IGP is that it has dual D-Sub monitor outputs onboard, sitting where the Serial ports have traditionally been housed.

And anyway, NVIDIA will also release a cut down 'SPP' (System Platform Processor) variant of the Northbridge that will remove the integrated core and cost but leave the good stuff in.

For your add-in graphics cards, AGP 8x is supported for external connections (nForce used AGP 8x for the integrated GF2 MX but only sported an AGP 4x slot).

On the south side, the rejigged MCP-T (Media and Communications Processor) has been updated with the latest and greatest technology. It now includes inbuilt support for IEEE1394, USB 2.0, ATA133 and dual 10/100 Ethernet, while the onboard sound hardware remains unchanged from the original nForce APU.

The inclusion of IEEE1394 support makes sense, as its isochronous nature fits well with the isochronous setup of NVIDIA's HyperTransport based StreamThru technology. It also fits well with the overriding digital entertainment focus of the nForce2.

This support will come in the form of ports attached via motherboard headers to a blanking plate.

USB 2.0 support appears via four onboard ports on the 8RGA+, both sitting under Ethernet ports. That's right, two onboard Ethernet connections obtained using an additional 3Com MAC on top of the existing integrated Ethernet. This inclusion of dual Ethernet may seem strange, but it comes into its own when you are using Internet connection sharing, allowing you to connect your ADSL or cable connection to your home network.

Over the coming months expect to see a hearts and minds campaign of sorts between the nForce2 and VIA's KT400 chipset. Both deliver features like AGP 8x, DDR333 and DDR400 support, USB 2 and ATA133, and both will squarely target the Athlon-using performance market. NVIDIA is demonstrating that it has listened to the criticisms about the original nForce, which bodes well for the chipset's performance when it does hit. However the actual numbers remain to be seen and rest assured that they will appear here as soon as a stable production board hits the *Atomic* Labs.

What NVIDIA has managed to achieve is wider support by motherboard manufacturers, such as EPoX with the 8RGA+. This should lead to more focus upon the chipset and a wider range of models than the previous generation. There are at least two distinct niches that models could be targeted at, an integrated graphics free model with good DDR performance would appeal to the hardcore gamers and a fully featured model would be a perfect solution for a loungeroom-based Internet gateway/network server/home entertainment PC.

For now we wait and see how NVIDIA has learned from its mistakes.

But rest assured the battle lines between the nForce2 and KT400 are now firmly drawn, and the winner is definitely going to be the end user.

# Compro VideoMate Cinema

Simon Peppercorn likes to watch.



Compro's VideoMate

Cinema is an AGP NVIDIA GeForce-based graphics card, which is bundled with an external video capture device and TV tuner. Previous versions of this package have been supplied with a GeForce2 MX400, and were marketed more towards the ViVo/TiVo fans, at the expense of serious 3D capabilities.

The current VideoMate Cinema range starts from the lowly GeForce2 MX-200 PCI, all the way up to a GeForce4 Ti4600. Our test model came with a GeForce4 Ti4200 128MB DDRAM twin view card, a VIVO (Video In Video Out) module and an impressive-looking remote control. The benefit of a combo like this, unlike combined TV tuner/video card devices, is that the tuner is an external device. This means that the video card itself is not burdened with the arduous video capture and TV tuning chores. As we have already made the joys of such a video card clear in previous editions of *Atomic*, let's look at the TV tuner/video capture side of things.

The external unit, containing the tuner, and capture ports, is a wonderful shade of *Atomic* green that sits snuggly inside a small, almost Palm-size casing. There are no external power supply requirements as it draws its power from the AGP port. It captures signals from a TV/CATV antenna, a composite and S-video line for VCR, DVD, video camera or console games. The unit also features a line-in and a line-out for audio and PC. The composite and S-video connectors allow the signal to be sent to an external video source, such as a TV or VCR. Oddly enough, the unit isn't fitted with full composite video connections, only the video-in/out sockets. The sound input/output is taken care of with standard RCA connections, which will prove bothersome should you wish to capture audio from a device fitted only with composite connections, such as many video or DVD players. But no matter, adaptors are available from electronics stores, should you really require them. The tuner itself is a standard Philips tuner as found on many TV tuner products. NVIDIA made it particularly difficult to open the device without damaging it, so we can't tell you exactly which Phillips tuner it is.

Unfortunately, the umbilical type connector from the tuner to the video card is not a standard type plug. We couldn't, for example, simply plug the tuner into any video capture-capable card. This is a shame, because we wanted to test

the capabilities of the tuner on its own, to determine how much it is reliant on the graphics card. It certainly isn't relying completely on the CPU to get the job done, as a quick peek at CPU use while decoding a TV signal shows usage at around 10%.

Installation was a breeze (heck, it's just a video card) and the software setup was straightforward. Included on the CD-ROM are NVIDIA detonator drivers, all the relevant WDM drivers, Compro PVR (for watching telly) Compro DVD, and Cyberlink PowerDirector 2.0 ME.

The Compro PVR provides a whole raft of functions to manage your presets, image quality and timeshift capabilities. Timeshift works by buffering the input signal, which allows you to pause, replay and schedule recordings, and so on.

As for performance, TV tuner devices quite often present comparatively poor images. There are a number of problems with various de-interlacing techniques, and other issues, that impact on the resulting display. However, unlike most TV tuner solutions, this device produces a very acceptable image, with no noticeable jitter or pixelation. We noticed some graininess on some presets, but nothing that really detracted from overall image quality. The video capture capabilities also performed well, supporting capture into MPEG-1 and real-time MPEG-2 compression.

The software bundle is certainly straightforward to use, but not as powerful as full retail apps, such as Adobe Premier. It will get you up and running, and provide you with all the basic video editing tools in a simple, easy-to-navigate interface. If it is your first time doing a bit of editing... then this is all you need.

So what makes this any different from other TV tuner/video capture solutions? For starters, USB ones just plain suck. Image quality is generally poor and bundled applications are often third rate. Standalone TV tuner cards are just that - standalone. They take an extra slot in your already overburdened system, and image quality still doesn't compare with most combined TV tuner/video cards. Many of these combo cards are quite good, such as the RADEON All-in-Wonders, but the graphics chipsets often don't cut it with the GeForce4 Ti4200/4600s. With GeForce4 Ti4200 video cards retailing around the \$450 mark, and a separate TV tuner card (of dubious quality) for around the \$100-\$125 mark, something such as this, is a worthwhile option, especially considering the quality it offers (something I have already raved about...). The Compro VideoMate Cinema is a nice little package indeed. The wide choice of bundled video cards, provided that you choose from the GeForce range, is pleasing. For the money, the TV tuning/capture quality is one of the best we have seen and the number of features is impressive - overall... we're excited!

## SPECIFICATIONS

NVIDIA GeForce video card; Dual S-video/composite input/output; Supports AVI, MPEG-1 and MPEG-2

**Website:** Compro [www.comprousa.com](http://www.comprousa.com)

**Supplier:** AMI [www.ami-computers.com](http://www.ami-computers.com)

**Phone:** AMI (02) 8338 0500 & (07) 3808 9255 **Price:** \$544

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# AOpen AX4B-533 Tube

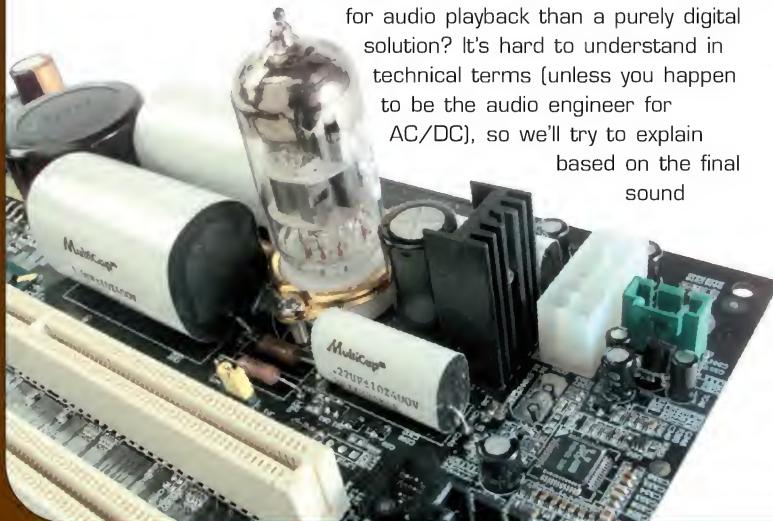
Bennett Ring inserts his tube into this mobo without getting electrocuted.



Do you remember the steam train in *Back to the Future III* that the Doc modified with high tech components, so that it could travel through time and therefore pave the way for the as yet unreleased *Back to the Future IV – Doin' it Neanderthal Style*? Well, the AOpen Tube is the motherboard equivalent of this demented smoke puffing Tardis, merging the technology of the 21st century with an invention Thomas Edison made in 1880 – the vacuum tube.

Considering that vacuum tubes are quite rare these days, except in high-end audiophile grade pre-amps and guitar amplifiers, we thought we'd give you a little bit of background as to what these archaic devices do, as well as how they do it. Each vacuum tube is comprised of four main components: a filament (heater), cathode, grid and anode (plate). When the original current runs through the filament it heats and causes the cathode to boil. As the cathode gets hotter, electrons are emitted, which pass through the grid and make contact with the anode. The end result is an amplification of the original AC signal. Manipulation of the grid voltage changes the characteristics of the final signal. Exciting stuff huh?

So why are pre-amps with tubes better for audio playback than a purely digital solution? It's hard to understand in technical terms (unless you happen to be the audio engineer for AC/DC), so we'll try to explain based on the final sound



output. Compared to the sound from a purely digital solution, a tube offers much richer and warmer audio. It also gives the sound more space; where a digital solution sounds like all of the sounds are coming from a small box, with a tube it sounds as if it's coming from a large concert hall.

One of its most notable effects is the separation of the high, mid and low range sounds. To sum it up, it basically sounds much less like a recording. It's very hard to describe on paper, but the difference is immediately noticeable when you listen to a song with a tube-based pre-amp and without.

Which is exactly what we did. The song we chose, Mercury Rev's *The Dark is Rising*, had a nice mix of voice, strings, piano and drums. Five of the *Atomic* staff listened to this song with the tube enabled, before replaying it with the tube disabled. The result was a unanimous thumbs up for the tube sound, although the pro DJ among the listening group found the high end cymbal sounds a little overwhelming.

The sound signal for the tube is supplied by an onboard AC'97 chip, which also has digital out for those with a Dolby fetish. To stop sound interference caused by the motherboard components, AOpen has used its proprietary Frequency Isolation Wall technology on the pre-amp area. Due to the varying sounds offered by different types of vacuum tubes, you can replace the Russian Sovtek 6922 vacuum tube that is included with other types, many of which are described in the manual.

While the strength of the tube is music playback, AOpen is also pimping it to gamers, with lines such as: '...the AX4B-533 Tube can deeply satisfy a gamer's cravings...' littered throughout the motherboard manual. Ummm, OK.

There's a slight problem with this: when playing through the tube pre-amp you're limited to stereo sound. Considering many gamers now use 4.1 surround sound, it's going to be a brave (or is that foolish?) gamer who steps back down to stereo sound. We tested this out with America's Army, and did notice that the sound effects sounded a little richer and warmer. However, we'd still pick surround sound for gaming over tube stereo any day of the week.

Other than the tube pre-amp feature, this is a stock standard i845E motherboard. In fact, it's probably a little under-featured compared to most i845E motherboards, with a meagre three PCI slots due to the massive pre-amp components. If you want to overclock, it includes FSB and Vcore tweaking, but alas no AGP/PCI ratio settings. A nice touch is the ability to play CDs without booting into Windows, known as the Open Jukebox, although this did seem a little flaky with different CD-ROM drives.

AOpen deserves a hearty pat on the back for this innovative motherboard. As a standard mobo, it's a bit of a stinker compared to the gamut of i845 motherboards that are now begging for your hard earned cash. However, if you consider yourself one of those audiophile music lovin' gurus, there simply isn't a patter sounding PC solution.

## SPECIFICATIONS

i845E chipset; three PCI slots; AC'97 onboard sound; three USB2.0 ports; one IEEE1394 port.

**Website:** AOpen [www.aopen.com.tw](http://www.aopen.com.tw)

**Supplier:** bluechip infotech [www.bluechipit.com.au](http://www.bluechipit.com.au)

**Phone:** bluechip infotech (02) 8745 8400 **Price:** \$499

9  
10



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**apc** Australian Personal Computer

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## atomic

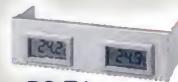
"Undoubtedly the parent of the Aluminium case craze, Lian Li has been incredibly successful in changing the case buying mindset."

See detailed reviews (search "Lian Li") at [www.dansdata.com](http://www.dansdata.com) [www.overclockers.com.au](http://www.overclockers.com.au) [www.gamingin3d.com](http://www.gamingin3d.com)



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### PC-T4B

Black LCD Dual Thermometer to fit 5.25" bay \$59.00 RRP

### PC-T3

Silver LCD Dual Thermometer to fit 3.5" bay \$59.00 RRP

### PC-T3B

Black LCD Dual Thermometer to fit 3.5" bay \$59.00 RRP

### MF-20

Aluminium extension mounting kit for 2 x 3.5" Drives. Attaches under your existing HDD bay

\$16.00 RRP

### MF-30

Aluminium extension mounting kit for 3 x 3.5" Drives. Attaches under your existing HDD bay

\$19.00 RRP



### MF-30

### Panel-65

Left side window panel for PC-60USB Case

\$70.00 RRP

### Panel-75

Left side window panel for PC-70USB Case

\$105.00 RRP

### PC-M2

Lian-Li silver hard anodized aluminium mouse mat

### PC-M2B

Lian-Li black hard anodized aluminium mouse mat

\$15.00 RRP

\$15.00 RRP

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## Aluminium Tower Cases



### PC-6087A

Green acrylic door \$439.00 RRP



### PC-6089A

Blue acrylic door \$439.00 RRP



### PC-39A

Silver hard anodized aluminium mini case with built-in 2 mobile racks. 8 total device bays 2x5.25", 1x3.5", 3x3.5" hidden for HDD. 2 x ATA133 lockable mobile racks. 2 x 8cm sleeve bearing case fans. 2 x front USB ports  
\$425.00 RRP



### PC-60USB (Silver)

\$299.00 RRP



### PC-65USB (Silver transparent panel)

\$369.00 RRP



### PC-61USB (Black)

\$340.00 RRP



### PC-7 (Black)

Full aluminium anodised black midi case  
\$260.00 RRP



### PC-5 (Beige)

Economy beige aluminium midi case with plastic front  
\$190.00 RRP



### PC-70USB (Silver)

\$499.00 RRP



### PC-71USB (Black)

\$539.00 RRP



### PC-30

Silver mini tower full aluminium anodised. Sliding tray for ATX motherboard. 2 Fans. Total 7 bays 2x5.25", 2x 3.5", 2x 3.5 hidden  
\$260.00 RRP



### PC-9300

Silver hard anodized aluminium desktop case. Total 4 drive bays. 2x5.25", 2x3.5" internal bays. 2 sleeve bearing fans. Suitable for Micro ATX M/B. 2 x front USB2.0 ports. Requires micro ATX PSU  
\$299.00 RRP

All cases come without power supplies

## Case Accessories



### Panel-65

Left side window panel for PC-60USB Case

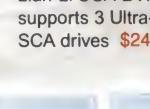
\$70.00 RRP



### Panel-75B

Black Left side window panel for PC-71USB Case

\$115.00 RRP



### EX-12

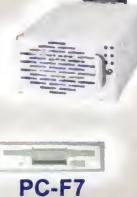
Lian-Li SCA-2 Hot Swap bay supports 3 Ultra-160 80 pin SCA drives

\$245.00 RRP



### PC-C2

For Sony CDU-211



### PC-C4

For Pioneer DVD-116

### PC-F7

For Teac CD-540E CD-ROM drives

\$12.90 RRP

\$12.90 RRP

For Teac CRD-8484B

\$12.90 RRP

For Aopen DVD-1648

\$12.90 RRP

For Asus CD-S520A

\$12.90 RRP

For Aopen 952E/AKH

\$12.90 RRP

For 3.5" Teac/Mitsumi floppy disk drive

\$9.90 RRP

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AusPcMarket	<a href="http://www.auspcomarket.com.au">www.auspcomarket.com.au</a>
ECOM Computers	Sydney City 02-9299 0022
BBOS Computers	Sydney City 02-9211 2919
Computer Interchange	Chatswood 02-9411 4144
Computer Interchange	Hornsby 02-9476 0833
Microtech Corporation	Auburn 02-9648 1818
Plug & Play Computers	Sylvania 02-9544 6911

### VIC

Digiworld	Melbourne 03-9663 6699
Scorpion Technology	Burwood East 03-9886 1615
PC Case Gear	<a href="http://www.pccasegear.com.au">www.pccasegear.com.au</a>
Computers & Parts Land	Notting Hill 03-9548 7088

### QLD

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Karana Computers	Chuwar 07-3812 5211
Tropical Wings Computer	North Cairns 07-4031 6883
TNQ	Mossman 07-4098 3888

### ACT

Cougar Computers	Mitchell 02-6242 2777
Technology Warehouse	Mitchell 02-6242 3966

### WA

Austin Computers	Osborne Park 08-9201 2788
PLE Computers	Wangara 08-9309-4771
Navada Computers	Osborne Park 08-9446 4099
Computer Cash & Carry	Leederville 08-9388-1202

### SA

Duncan Computers	Adelaide 08-8212 6600
Cherry Computers	Adelaide 08-8232 5700
Adrenalin Computers	Adelaide 08-8410 0777

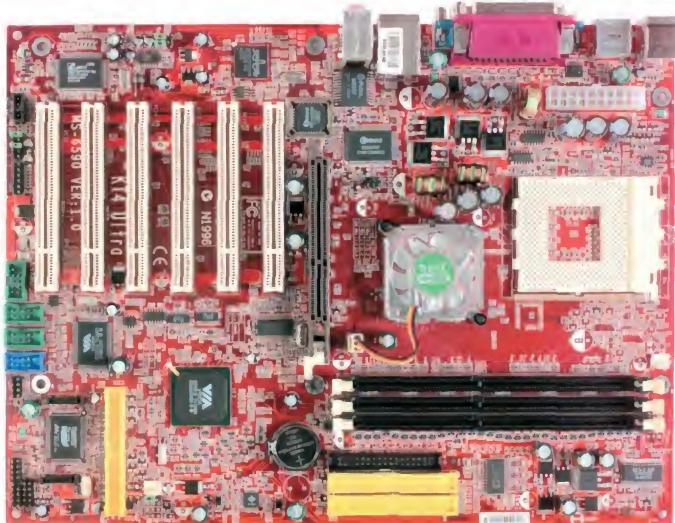
### NT

Tec Chips	Coconut Grove 08-8948 3663
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[www.anyware.com.au](http://www.anyware.com.au)

# MSI KT4 Ultra

John Gillooly says it ain't just sports cars that are red and loaded with features.



We are now firmly into the age of 'But wait! There's more!' motherboard marketing. Unfortunately, a long and arduous search through the paraphernalia that fills the MSI KT4 Ultra box failed to turn up a set of steak knives, but the sheer volume of extra features, cables and other assorted add-ins makes up for that glaring omission.

These extra features start with those inherent in the VIA KT400 chipset and expand from there. After concentrating on increasing DDR speed in the past few iterations of its KT series of Athlon chipsets, VIA is using the KT400 to supply a host of new functions.

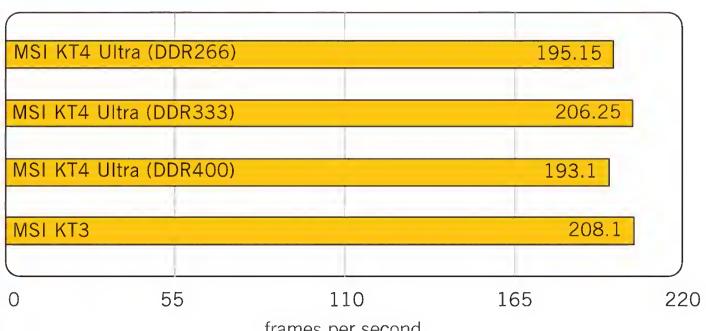
The KT400 delivers three main additions: 8x AGP, USB 2.0 and 533MB/sec V-Link connectivity between the North and South Bridges of the chipset. VIA has also added partial support for DDR400, but the immaturity of this technology as well as the lack of a JEDEC standard means that it is both RAM-dependent and limited to only being able to run one DIMM when set at DDR400 speed – this is not too great a problem as there is minimal performance boost between DDR266 and DDR400 due to the Athlon's 266MHz effective FSB. If and when AMD decides to increase the Athlon XP's FSB to 333MHz you need not worry, because the KT400 has support for this.

MSI has added a pile of features to those already offered by the KT400, including three IEEE1394 ports supported via motherboard headers and a supplied blanking plate, two Serial ATA connectors via a Promise 30276 RAID controller, SPDIF audio out and a Broadcom controller for Gigabit Ethernet.

When we started to test this board we were surprised by how unstable it appeared. The Corsair XMS3200 DDR that we initially used had great problems running at DDR400 speeds. These issues were mediated somewhat by using a newer BIOS and Adata DDR400, which uses Winbond rather than Samsung memory chips.

We tested the board with SYSmark2002 and Quake 3: Arena, playing around with different RAM speeds and even using our unlocked Athlon XP 1800+ running on a 333MHz FSB to get a good idea of how the board performs. We

## Quake 3: Arena – CPU



## SYSmark2002 Rating



have compared these results to the MSI KT3 Ultra, which uses the previous generation KT333 chipset from VIA.

Our results demonstrate exactly what one would expect from the bottlenecking of the system by the CPU: minimal differences. The lower scores for DDR400 stem from having to detune the RAM settings in order to get the system running stably with the RAM at 400MHz.

The DDR333 scores are almost identical to the KT3 Ultra but may improve as the chipset matures and our 333MHz FSB tests indicate that the expected performance increases will become more obvious if and when the Athlon XP makes that move.

While the overall performance difference between the KT4 Ultra and previous chipsets is minimal, it comes into its own with the inclusion of next generation technologies.

If you are looking at grabbing yourself a RADEON 9700 card then the inclusion of AGP 8x makes the KT400 chipset stand out over other currently available Athlon chipsets, and the other features on the KT4 Ultra such as Gigabit Ethernet and Serial ATA mean that it will just keep on getting better as these become more widespread.

MSI has done a remarkable job with the KT4 Ultra, making it the most future proof Athlon mobo you can currently lay your hands on.

Feature junkies of the world unite, for we have found ourselves a new champion.

## SPECIFICATIONS

VIA KT400 chipset; two S-ATA ports; Gigabit Ethernet; IEEE1394; USB 2.0; three DIMM slots and six PCI slots.  
**Website:** MSI [www.msicomputer.com.au](http://www.msicomputer.com.au)  
**Supplier:** MSI [www.msicomputer.com.au](http://www.msicomputer.com.au)  
**Phone:** MSI (02) 9748 0070 **Price:** TBA

9/10

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**Thunder i7500Pro**  
S2721UGN/GN



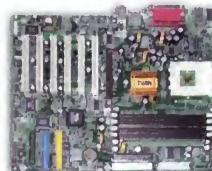
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- 1U rack-optimized
- Adaptec® Ultra320 SCSI (optional)
- EPS 12V or ATX 12X power, E-ATX

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S2490ANS/AN



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# Jazz Speaker J8902 three-piece speaker system



From deep within the 'What the hell were they thinking?' files, comes the Jazz J8902 three-piece speaker system. Without a doubt, these are the oddest-looking speakers we have seen at *Atomic*. Unfortunately, they are also probably the worst. But let's not go on about appearances as the photos speak for themselves.

What this system lacks in design quality it also lacks in sound capabilities: the 4in subwoofer is seriously underwhelming.

Well... it is only rated at 12W RMS. The speaker itself sits in the base pointing downward with the sound emitting from underneath. Customarily built into wooden cases, this speaker is constructed from a cheap plastic.

The bass sound it puts out is muddy and distorted at anything above a medium volume.

The left and right 2.5in speakers do nothing except make a noise only resembling the sound you are expecting to hear. Fortunately the speakers are magnetically shielded, so perhaps you can hide them behind your monitor or something. Are we being too bitchy here?

The plastic control box is flimsy and cheaply constructed: it provides a power button, a single volume control and a bass adjustment. Admittedly, providing the control box separate from the speakers is actually a welcome idea because it offers a better means of controlling sound levels than messing around behind subwoofers, which other more expensive systems force you to endure.

Jazz has traditionally produced some quality speakers, so why the heck it would put its name on something like these is beyond understanding. We don't like to be this negative about any product, however... considering the quality of similarly-priced speaker sets we have reviewed, such as the Hercules 210 system, this one is abysmal, and should be immediately relegated to the novelty bin.

## SPECIFICATIONS

20 Watts RMS (Sub 12W, speakers 4W each); frequency response: 50Hz – 20,000 Hz; impedance: 4 Ohms.

**Website:** Rectron [www.rectron.com.au](http://www.rectron.com.au)

**Supplier:** Rectron [www.rectron.com.au](http://www.rectron.com.au)

**Phone:** Rectron (02) 9748 7725 **Price:** \$109

**3/10**

# Cellink Solar Opti-Mouse



When you think of the things that are most

unlikely to experience long exposure to sunlight a computer and its peripherals sit close to the top of the list. So the creation of the solar powered mouse is perhaps the most incongruous invention we have seen pass through the *Atomic* Labs.

While it is powered by two AAA batteries, the Cellink Solar mouse has a solar panel built into the top in order to recharge the batteries and extend the battery life. Naturally the panel will always be covered by your hand when it is in use, and when idle it will most likely be sittings indoors, so despite the ability for solar cells to work under fluorescent light our tests indicate that this still doesn't provide sufficient charge for prolonged use.

Of course, if your memory is good you could always be sure to leave the mouse sitting on a sunny windowsill when it isn't being used...

Apart from the solar gimmick, this is a fairly good quality wireless mouse. The unit is small and very solid, and has a nice smooth action and comfortable design. Unlike fancier mice it only has two buttons and a scrollwheel, but for those after basic functions from a wireless mouse it has one of the best designs we have seen in the *Atomic* Labs.

We solidly tested the mouse for a month, curious as to how long the battery would last with the added solar boosting. After around three and a half weeks of fairly solid use the batteries died, demonstrating the pointlessness of using something reliant upon solar power in your typical computing environment. Like most RF mice, we still found that the Cellink Solar Opti-Mouse was not as accurate a gaming mouse as corded versions, but for other operations it was more than adequate.

Take away the solar panel and the Cellink mouse is a very nice unit indeed. Add the panel and the obvious bump up in cost and it's more of a novelty unit. We would definitely recommend the non-solar variants of Cellink's wireless line, but this one unfortunately falls into the gimmick category.

## SPECIFICATIONS

800-600dpi resolution; two metre operating range; solar recharging; RF wireless mouse.

**Website:** Cellink [www.cellink.com.tw](http://www.cellink.com.tw)

**Supplier:** Checksun [www.checksun.com.au](http://www.checksun.com.au)

**Phone:** Checksun (02) 9317 3155 **Price:** \$110

**6/10**



## Atlas SF-201B



Just like the Antec model we had a look at this month, the Atlas is yet another pre-modded beastie, arriving with a record-breaking six fans installed throughout. Two suckers are mounted at the front, with another two extracting air from the interior at the rear, which isn't out of the ordinary. However, the two fans that put this into the 'crazy about cooling' category are mounted in spots that only a certified case modder would appreciate.

The first is located directly above where the CPU is mounted, perfect for those with an overclocked CPU that needs a steady supply of cool air (although you'll have to reverse its direction so that it sucks instead of blows). The other is mounted in a blowhole at the top of the case, helping to keep the interior of the case nice and cool. Each of these six fans has a protective golden fan grill, ensuring that none of your cables stray into their whirring blades of destruction.

The entire case is constructed of anodised black Aluminium, and this includes the all black interior, making this the ideal case for a window mod. An acrylic front facia, complete with six gold thumbscrews keeping it in place, adorns the front of the case.

The *Atomic* nuclear bunker was divided roughly 50/50 over whether or not this case's aesthetics fell into the Cameron Diaz or Bronwyn Bishop categories. Also mounted on the front are an I/O tray, with four USB ports, two audio jacks and a FireWire port.

For those who like to tinker, the removable motherboard tray will surely be appreciated. One of the hard drive bays is also removable, being held in place with thumbscrews.

If you're one of those naughty file sharing types, you'll also admire the amount of drive bays crammed into this midtower: four 5.25in and nine 3.5in bays make this the perfect case for even the PrOn Distribution Emperor of Australia.

For a meagre \$88 more, a 400watt SuperFlower PSU is included, which has an additional two fans, bringing the total number of fans to an incredible eight! This rivals the amount even the most obsessed case modders install.

While this would have to be the most feature rich case we've ever seen, it's not particularly aesthetically pleasing. But apart from that, it's worth the cost of admission. □

### SPECIFICATIONS

500x210x460; slide out motherboard tray; Multimedia port with four USB ports; one FireWire port; and two audio jacks.

**Website:** LePont [www.lepont.com.tw](http://www.lepont.com.tw)

**Supplier:** AusPC Market [www.auspcmarket.com.au](http://www.auspcmarket.com.au)

**Phone:** AusPC Market (02) 9817 2899 **Price:** \$429 with PSU

**8.5/10**

## Toshiba e740 Pocket PC



If you don't own a PDA, you simply can't call yourself a true geek. How else is any self-respecting tech head supposed to keep track of their LAN events and freelance PC building jobs on top of their no doubt packed social lives? But to stand out from the crowded bunch of PDA wannabes, a PDA needs something special, something to make you realise just how much you really need it.

The e740 from Toshiba has two such eye openers – why else would

*Atomic* be checking it out? First up, and a feature that will appeal to the performance whores among you, is the Intel Xscale processor, which runs at a gut busting 400MHz. This makes it easily the fastest processor in use on a PDA today.

However, we've got to ask ourselves if we really need 400MHz processors to power our calendars and appointment books? Of course not. And speed comes at a cost (about \$60 a gram). The cost in this case is battery life: you've got a piddling three hours worth if you crank the backlight to full brightness and carry out normal PDA tasks. Tsk Tsk Mr. Toshiba.

The second feature, and one that is much more practical, is built in Wi-Fi functionality. Setting this up on our wireless LAN

was as simple (or tricky, depending on your networking skills) as any other Wi-Fi device. We tested the file transfer speed from our file server to the e740 while standing near the Wi-Fi access point, and recorded a transfer speed of around 1Mb/s – not as fast as expected. Surfing the Net on this handheld device was a joy to behold, as it didn't reformat the pages into the jumbled mess we've seen on many other PDAs.

Other than these two features, the e740 is a fairly standard PDA. 64MB of RAM and 32MB of ROM provide for a total of 96MB of storage space, while the screen has a fairly average resolution of 320 x 240. Windows Media Player 8, Microsoft Reader, Pocket Word and Pocket Excel are the major applications included in the software bundle. If you feel the need, SecureDigital and Compact Flash slots are also included.

While this is a nice looking unit with a couple of features above and beyond what we've come to expect from a PDA, the low battery life simply can't be ignored. Perhaps you're going to have to wait for alternate power sources to be developed before PDAs with processors running at 400MHz and beyond become truly worthy of your purchase. □

### SPECIFICATIONS

Xscale 400MHz; 2.5in 240 x 320 16-bit colour TFT; Wi-Fi functionality.

**Website:** Toshiba [www.toshiba.com.au](http://www.toshiba.com.au)

**Supplier:** Toshiba [www.toshiba.com.au](http://www.toshiba.com.au)

**Phone:** Toshiba 13 30 70 **Price:** \$1,548 with Wi-Fi

**7/10**

**\$1,999 inc GST**

# **Atomic Special! Gaming PC System featuring AMD Athlon™ XP Processor 2000+ with QuantiSpeed™ architecture**



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## Yamaha CRW-F1



As many burner manufacturers make a living from providing minor bumps in speed on their drives, Yamaha stands out for releasing models at a slower pace, but making sure that each drive stands out from an overcrowded pack. The CRW-F1 continues this legacy in a number of ways, from the gimmicky to the techie.

This 44x full CAV CD-writer introduces the funkiest gimmick to hit CD burners in years, known as Disc T@2. If you only partially fill up a CD-R, the CRW-F1 can use its laser to etch images into the remaining space, rendering the disc unusable but oh so sexy. In practice, the resultant image is highly dependant upon the dye used in the CD-R, with the best images coming from Yamaha's own discs.

Also supported is the new CD-MRW format aka Mount Ranier; even though this won't make a full impact until OS-level support becomes available. But it is nice to get a product that is ready for this eventuality. What is does do is pave the way for Yamaha pumping the rewrite speed of the drive up to a

phenomenal 24x. The third string in the CRW-F1's new feature bow is Yamaha's Advanced Audio Master Quality Recording, which uses tricky laser tricks to produce audio and data CDs at professional mastering quality. This is a hard one to test however, but Yamaha alleges that it will produce longer lasting and more reliable CDs than normal burning methods.

To prevent failed burns the CRW-F1 employs an 8MB buffer and Safe-burn technology, rounding out the package nicely. We tested the Yamaha CRW-F1 using CDSpeed99 and it performed up to spec. This is unsurprising and indicative of most drives on the market these days.

In a marketplace crowded with decent but uninspired CD burners, the Yamaha CRW-F1 is a blast of fresh air. There is something special about this drive, from the added extras such as disc T@2 to the phenomenal performance when both writing and rewriting.

Perhaps the biggest example of how different this drive is, lies in the sexy blue LED used for a drive light. A very special piece of hardware indeed.

### SPECIFICATIONS

44x write, 24x rewrite, 44x read. Disc T@2, CD-MRW support, Safe-Burn, 8MB buffer.

**Website:** Yamaha [www.yamaha.com.au](http://www.yamaha.com.au)

**Supplier:** Yamaha [www.yamaha.com.au](http://www.yamaha.com.au)

**Phone:** Yamaha 1800 682 705 **Price:** \$349

9.5/10

## Leadtek WinFast TV2000 XP



Watching TV on your PC usually involves staring intently at the monitor trying to make out the image through a haze of distorted pixels and static. However, at the recent Computex event we saw the first ever TV tuner that actually left us impressed by its image quality. It was manufactured by Leadtek, who decided to make a stand-alone version so users can upgrade their 3D graphics card independently of the TV tuner.

When we received the tuner it was blindingly obvious that the only program deserving of the trial run was an episode of *Buffy*. Unfortunately the image quality didn't turn out to be quite as clear as what we saw at Computex – you can thank PR wizardry for that. However, it was still easily the clearest TV picture we've ever seen on a PC TV tuner, presenting Sarah Michelle in all her voluptuous beauty. Surprising then that this tuner card uses the

same Philips TV tuner component found on most TV tuners.

According to Leadtek, the reason its tuner works better than the rest is due solely to drivers. Apparently it found the drivers that Phillips supplied to be a total bug fest, so Leadtek proceeded to develop its own. Not only has this improved the image quality, it also made the instability we've seen in many previous TV tuners a thing of the past.

Installation of the tuner was a cinch, although it did take a little while to figure out how to manually fine-tune each channel, as the handbook doesn't make this obvious (ctrl+/ctrl- if you're wondering). After installing it, we were greeted by arguably the most attractive and feature-rich TV tuner application we've yet seen. Full recording features are included, allowing the user to select from the most popular video formats for the PC. Be warned, if you wish to make high quality recordings it's going to chew up your disk space faster than Napster on steroids. A very nice touch was the ability to turn your entire Windows desktop background image into the TV window. The unit also includes full FM radio functionality, and this feature is as impressive as the rest of the card.

### SPECIFICATIONS

Picture-In-Picture; FM radio; Composite and S-Video inputs; and IR remote control.

**Website:** Leadtek [www.leadtek.com.tw](http://www.leadtek.com.tw)

**Supplier:** BCN tech [www.bcntech.com.au](http://www.bcntech.com.au)

**Phone:** BCN tech (02) 9648 0888 **Price:** \$159

9.5/10

## Antec Performance Plus 660AMG



In the past if you wanted your PC case to bristle with fans, but didn't have the strength in your withered geek body to pick up a dremel or nibbling tool, you'd have to take it to the closest metal works shop, where a remnant from the Neanderthal age would charge you an arm and a leg to cut a simple hole. Now that the rest of the world has caught on to the fact that overclocking, and hence better-cooled cases, can help you get a faster PC for less bucks PC cases are now being manufactured with these fans already built into the case.

This Antec case is one such unit, and as you can see from the photo it has an 80mm fan built into the left hand removable side of the case. Unfortunately this fan is placed a tad low – it hovers over your PCI slots – and any case modder, or for that matter *Atomic* reader, knows that the best place for a side fan is directly over the CPU, where it can pump cool air straight into the top of your CPU heatsink.

Another 80mm fan is included at the rear of the case, as well as two mounting brackets at the front of the case for additional 80mm fans. Each fan is mounted on a special plastic

bracket, helping to reduce vibrations and therefore sound.

A nice touch is the removable internal 3.5in drive bay, which is held in place by a simple locking mechanism, and also includes a plastic fan mount at the front of the bay for those who are running a few steamy hard drives. The front facia of the case also has a little flip up cover, which protects an IEEE1394 and two USB ports.

For the price, this is a surprisingly sturdy little case, with none of the flexing metal and wobbling chassis so common in low priced cases. All interior edges are rounded to keep your flesh intact when working inside your PC's guts.

Whether or not this case is attractive to look at is a very subjective question, but the general opinion in the *Atomic* cave is that this is indeed an attractive case, in an industrial, chunky kind of way. However, those with an aversion to plastic facias might not find it so appealing.

Other than the placement of the side fan, this is an otherwise excellent case, especially when you consider the cost includes a 330W PSU.

### SPECIFICATIONS

Mini-tower; two 80mm fans; one IEEE1394 and two USB ports on the front, 330W PSU.

**Website:** Altech [www.altech.com.au](http://www.altech.com.au)

**Supplier:** Altech [www.altech.com.au](http://www.altech.com.au)

**Phone:** Altech (02) 9748 2233 **Price:** \$220

8.5/10

## Coolermaster PNK-U01 Pro Studio Noise Absorption Kit



In the *Atomic* Labs we have now become accustomed to living with the howl of high speed CPU fans, but that tolerance is not something we want to maintain when gaming at home. A

quiet PC is a good PC, and when you need to keep an overclocked system cool and are afraid of water cooling, soundproofing is the way to go.

Enter Coolermaster and its PNK-U01 Sound Absorption Kit, otherwise known as a tacky green plastic case full of bits of foam. But this is no ordinary foam, it contains two different types of special adhesive backed, 'studio quality' acoustic foam, designed to either absorb sound or prevent it leaking out. And that is all the kit contains. One of the biggest concerns is that there is a lack of good documentation to help in your quest for silence.

The basic premise of the kit is that the knobby sound absorbing foam should be mounted on the inside of the case opposite your CPU to catch the howling fan noise and also placed wherever it can stop other direct sources of noise.

The thinner foam should be used to cover areas such as spare fan holes where noise may leak out (caution must be taken to watch case temperature as you block off holes), and it comes in a variety of pre-cut shapes to help you in this endeavour.

Installation is simply a matter of press-out and stick-on, with consideration to just how your case works. For instance, we tested this kit on an AOpen HX08 full tower case, which uses sliding side panels – a configuration that won't work when you stick an extra few centimetres of thickness to the panel. So some slight hacking changed the sliding side panel to a swivelling one and the soundproofing could continue.

In the end, while the kit did not really soundproof the case, it certainly took the edge off the noise of the 7200rpm fan lurking within. End results will depend on case model and how you apply the foam, but an average decibel level drop of between 5-10% would be expected. This kit won't give you a silent PC, but it will certainly tone down a screamer to bearable levels.

### SPECIFICATIONS

Two different grades of acoustic foam: the knobby kind and the other stuff. Green plastic briefcase.

**Website:** Coolermaster [www.coolermaster.com](http://www.coolermaster.com)

**Supplier:** Australia IT [www.australiait.com.au](http://www.australiait.com.au)

**Phone:** Australia IT (03) 9882 1811 **Price:** \$49

7.5/10

# Olympus Eye-Trek FMD-200



In the not-too-distant future the thought of having a 20 kilogram block sitting on your desk or at the front of your lounge room to display the output from your PC, DVD player or console will seem as ridiculous as the concept of washing your own dishes in this age of dishwasher sorcery. It's inevitable that Head Mounted Displays are going to become the display device of choice, and this headset is a prime example of just how close this technology is to hitting critical mass.

This HMD is not designed for use on a PC – instead of a D-Sub input it uses the RCA plugs you'll find on any modern TV, and it's also limited to the same resolution of a PAL TV. As a result, it's not of any use for PC gaming, unless you don't mind running at low resolution. However, as a display device for your next-gen console or mobile DVD player, this HMD is a fine candidate for the tax refund you just got. This would have to be the most comfortable HMD we've ever worn, weighing in at a meagre 85 grams; much lighter and comfier than the chunky HMD we checked out last month. Think a clunky pair of '70s sunnies and you've got a good idea of how comfortable this device is. As a result,

wearing this device for hours at a time won't leave you in need of a neck brace. The image you are presented with is the equivalent of a 52in screen hanging in front of your face at a distance of two metres. We hooked the FMD-200 up to a PS2 and sat back for some 'in yo face' DVD viewing and gaming action. Impressed we most certainly were. There was a little pixelation evident due to the close distance between our eyeballs and the twin TFT screens, but that was the only complaint we could come up with. There were no problems with refresh rate or pixel refresh times, and even the sound provided by the two ear buds was of a very high standard.

Unfortunately you can't use these as part of a VR setup, unless you don't mind running them in low res on your PC. There is no built in motion tracking functionality, and today's consoles don't have third party motion tracking devices available. But if you're after an extremely portable display device that provides you with an excellent picture, and have a few grand to spare, look no further than the end of your nose, upon which you'll be resting the FMD-200. □

## SPECIFICATIONS

85 grams; twin 0.55in TFT LCDs; image = 52in screen at two metres viewing distance.

**Website:** Olympus [www.olympus.com](http://www.olympus.com)

**Supplier:** Mindflux [www.mindflux.com.au](http://www.mindflux.com.au)

**Phone:** Mindflux (02) 9416 9619 **Price:** \$1,499

**8/10**

# Top View four port KVM



KVMs are cool. Not only are they cool, they're also useful – which is definitely a good thing. Of course, if you only own one computer, or if you have enough monitors, keyboards and mice for every box you own, then they're not so useful. But they're still damn cool, so don't argue.

The Top View four port KVM switch is a rather standard affair as far as KVMs go, however, it has two features worth mentioning.

The first is bandwidth: 200MHz of video bandwidth for you to play with, which equates to a maximum resolution of 1920 x 1440. There's no way in hell you'll be running that res at anything greater than about 70Hz refresh, but it's more than adequate for running a bunch of boxes at 1600 x 1200 x 85Hz.

Normally 200MHz of bandwidth wouldn't be worth mentioning because it's pretty much standard on KVMs these days. However, when you consider that you're getting a four port KVM, and you're getting it for only \$139 (yes that is the price and no we didn't make a typo), Top View's offering becomes much more attractive, especially when you consider that similar

devices can retail for figures approaching \$300.

You'll find the auto-scan feature useful, especially for keeping an eye on every system while lying on the couch watching Lain DVDs and scoffing pizza. There's also an audible switching alert (which you can thankfully turn off). The unit requires no special software or drivers to operate, comes with four sets of cables and can be cycled both manually as well as via a number of hotkey combinations. Really, that's a standard feature list for this type of device.

Unfortunately, there are a few drawbacks. Most are little 'extra touch'-type things that would be nice to have, but are simply not core to a basic KVM switch. Things such as an integrated USB hub so you can use your Logitech Dual Optical mouse without resorting to USB-PS/2 converters. Serial connections for old, old mice. Niggly things like that.

If you have a bunch of beastie boxes, but not the budget to match them with a bunch of beastie Trinitrons, take a look at KVMs. More specifically, unless your need for USB support is great (sharing say a scanner among four systems), check out the Top-View four port KVM. □

## SPECIFICATIONS

Four ports (two PS/2, and oneVGA); 200MHz bandwidth; max 1920 x 1440 resolution; cables inc.; auto-scan.

**Website:** PCR Range [www.pcrange.biz](http://www.pcrange.biz)

**Supplier:** PCR Range [www.pcrange.biz](http://www.pcrange.biz)

**Phone:** PCR Range (08) 8322 9378 **Price:** \$139

**8/10**



Atomic HOT Award  
September 2002

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# Tyan TACHYON G9000

Bennett Ring couldn't figure out how to plug a CPU into Tyan's latest toy.



No, you didn't enter an alternate dimension the moment you started reading this review – where motherboard manufacturers make video cards and McDonalds is the leading contractor building the International Space Station. Tyan, more commonly known as a leading manufacturer of SMP server motherboards, has dipped its experienced fingers into the graphics card honey pot. And you thought the video card market was overcrowded.

Considering Tyan's solid reputation for producing high-end motherboards, it's going to be very interesting to see if these high production standards carry over into its graphics card lines.

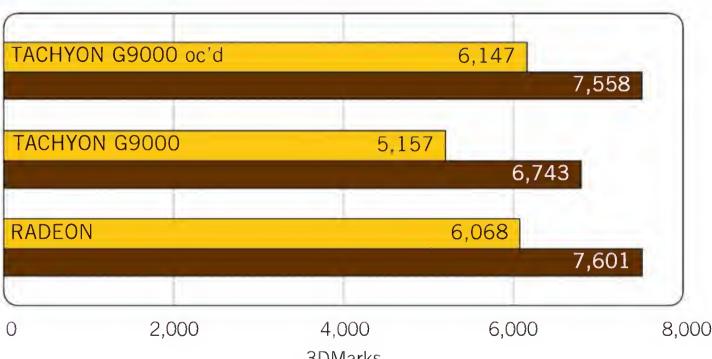
The TACHYON G9000 is the first Tyan video card to hit the Australian market, and it's based around the new RADEON 9000 PRO (RV250) chipset. Last month we checked out another card that used this chipset, S-MEDIA's RADEON 9000 PRO, and were impressed by its full DirectX8 functionality, rich feature set and decent performance at a very reasonable cost.

The Tyan TACHYON G9000 uses Hynix 3.3ns DDR-RAM, which is rated to run at a maximum speed of 300MHz. We were able to overclock this memory to a stable speed of 310MHz. The core proved to be already clocked close to its limit, and was overclocked to 310MHz, which is a meagre 10MHz faster than the overclock we squeezed out of the S-MEDIA RADEON. At these speeds, we noticed a performance gain of around 10% in most benchmarks, although Serious Sam SE strangely reported no performance gain at all.

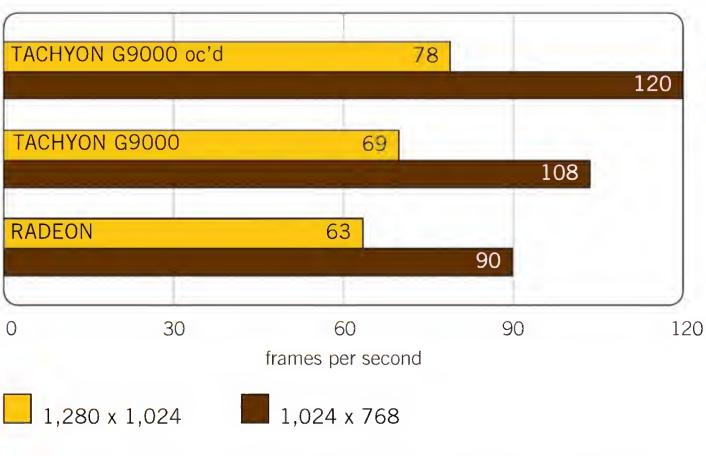
One of the biggest problems with the RADEON 8500 release was poor driver support, which caused woes with many popular games. Unfortunately it looks as if these problems have reared their glitchy heads once again, as we discovered several issues when trying to benchmark the TACHYON G9000. In last month's RADEON 9000 PRO review, we mentioned the inexplicably high frame rates recorded in Serious Sam SE. After some experimentation we have finally discovered why: it appears that the RADEON 9000 drivers won't allow the game to run using Serious Sam SE's High Quality settings, resulting in higher frame rates than expected. However, the drivers did allow us to test at the Normal Quality, 16-bit graphics settings, so you can finally see how these cards perform in this OpenGL benchmark. Another problem was discovered when we tried to run the very taxing Code Creatures benchmark – it simply wouldn't run at all.

You'll also notice that the benchmark scores for the Tyan card are up to 10% slower than the S-MEDIA card. This turned

## 3DMark2001SE



## Quake 3: Arena Max



out to be a problem with the newest drivers that were supplied with the Tyan card, as the S-MEDIA card also noticed a performance hit when using the new drivers. Not good.

Thankfully, we were able to run our benchmarking stalwarts without difficulties. As the graphs show, the RADEON 9000 is only marginally slower than the RADEON 8500, with the largest performance difference being 18% in 3DMark2001 SE at 1024 x 768 resolution. Q3: A performance was more impressive, beating the 8500 by 20% at 1024 x 768 resolution. As the RADEON 9000 PRO is much cheaper than the 8500, these results make this video card a compelling purchase, especially if you're going to be play games using the Q3: A engine.

While we were quite pleased with the S-MEDIA RADEON 9000 PRO, we have to say that the Tyan TACHYON G9000 is an even better buy considering the lower price of \$220. The only barrier to its mainstream success is a buggy driver set, something all RADEON 9000s are going to have to deal with. Considering the refinement we saw with ATI's RADEON 8500 drivers, this shouldn't remain a problem for long.

## SPECIFICATIONS

ATI RV250 chipset; 64MB 275MHz DDR-RAM; AGP 4X.  
DVI and 15-pin D-Sub connector.

**Website:** Tyan [www.tyan.com](http://www.tyan.com)

**Supplier:** Digicor [www.digicor.com.au](http://www.digicor.com.au)

**Phone:** Digicor (03) 9560 7222 **Price:** \$220

8.5/10



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## Zalman CNPS 6500B-Cu



Looking like a bizarre cyborg peacock sent back through time to kill a rogue seagull that is destined to become the leader of a gull rebellion in the distant future, the Zalman

CNPS6000-Cu HSF we reviewed in *Atomic* 14 is like no other

heatsink. This revolutionary HSF not only had the funkiest design we've yet to see, it also offered very respectable performance at a very low noise volume. Now that the P4 is starting to turn up the heat as it continues its meteoric rise in frequency, Zalman has decided to release a Socket 478 P4 cooler based on the same design.

This HSF is rated for 2.4GHz Pentium 4s and beyond, and is built almost exclusively from copper. One of its most remarkable features is the fact that each heat-dissipating fin isn't joined to a separate baseplate. Instead, each fin is lined up perfectly and then melded together, before being polished to create a very flat base. This makes it a much more efficient mover of heat than the traditional HSF design, which joins the fins to a separate base. It also costs more to produce an HSF this way – part of the reason this isn't an HSF for those on welfare benefits. As you'll see from the product shot, this cooler doesn't have the fan

mounted directly on top of the heatsink. Instead a special bracket connects to your case innards, from which the 80mm fan can be positioned directly over the top of the heatsink.

We mounted this copper peacock to a 2.4GHz P4 running at default voltage on our BD7II motherboard to see how it would fare against the HSF Intel ships with this CPU. Ambient temperature was a constant 20°C throughout the testing period.

When the CPU was busting its gut under full load, the Zalman cooler reached a maximum temperature of 45°C – very impressive when you consider that the standard Intel cooler reached a temperature of 50°C. Idle temperature wasn't quite as mind blowing, cooling a single degree lower than the Intel HSF at 39°C. These temperatures are even more impressive when you consider that this cooler is as quiet as the near silent Intel cooler.

If you don't mind paying a premium for a high quality P4 HSF, the CNPS 6500B-Cu offers extreme performance without extreme noise pollution. And if you've got a case window, your modded beast is begging for this bizarre creature. □

### SPECIFICATIONS

2,500rpm 80mm fan with speed controller and proprietary case mount; copper construction.

**Website:** Zalman [www.zalman.co.kr](http://www.zalman.co.kr)

**Supplier:** Quiet Computers [www.quietcomputers.com.au](http://www.quietcomputers.com.au)

**Phone:** Quiet Computers (07) 5543 1945 **Price:** \$95

**9/10**

## Thermaltake Volcano 9



Thermaltake has manufactured so many different models of Volcano heatsinks, it should really be based somewhere in Hawaii. The latest version, the Volcano 9, has to be the most feature-packed HSF we've ever encountered. Let us explain.

Other than the copper core and 80mm fan, the most exciting

feature of this product is its various fan speed controllers. First up is a temperature probe at the end of a 30cm lead, which can be mounted anywhere within the HSF, or even right next to your CPU core if you so desire (just don't put it *on top* of the CPU core, unless you enjoy the smell of melting silicon). This automatically varies the speed of the fan from 1,300rpm at 20°C, all the way up to 4,800rpm at 55°C. The Volcano 7 had a similar probe, but this was mounted near the fan, rendering it useless. It's great to see that Thermaltake has responded to the complaints about the Volcano X's probe.

If that method of fan speed control doesn't grab your fancy, a rotating dial can be attached to the fan, allowing you to manually control the speed from whisper quiet up to bug-the-shit-out-of-your-housemate volume levels. Finally, if you're a foot-to-the-floor tweaker type, you can set the fan speed to run continuously at

the highest speed. You might be inclined to use the top speed mode, until you hear just how loud an 80mm fan is at close to 5,000rpm. We tested this HSF against our trusty FOP-38, on our regulation Athlon testbench. Ambient temperature was a constant 20°C throughout the tests.

The first mode tested was the highest speed setting, and the CPU peaked under load at 46°C – identical to the FOP-38. At idle the CPU maxed out at 41°C – identical again to the FOP-38. Next up was the temperature probe with dynamic fan speed adjustments. For this test the probe was taped in position on the CPU, with the tip of the probe resting against the side of the core. Under load, the fan reached a maximum speed of 3,300rpm, and as a result the temperature rose to 54°C. However, it was almost silent at this speed. When the CPU was idling the fan dropped to 2,500rpm, at a temperature of 49°C.

While the results for this HSF aren't an improvement over the FOP-38, the range of options make it special. Whether you're after maximum performance, or prefer something that will cool well but isn't going to wake your dead grandmother, the Volcano 9 can cater to your every desire. Well, almost. □

### SPECIFICATIONS

Three fan speed controllers: dynamic with probe; manual with dial; and full speed.

**Website:** Thermaltake [www.thermaltake.com](http://www.thermaltake.com)

**Supplier:** Anyware [www.anyware.com.au](http://www.anyware.com.au)

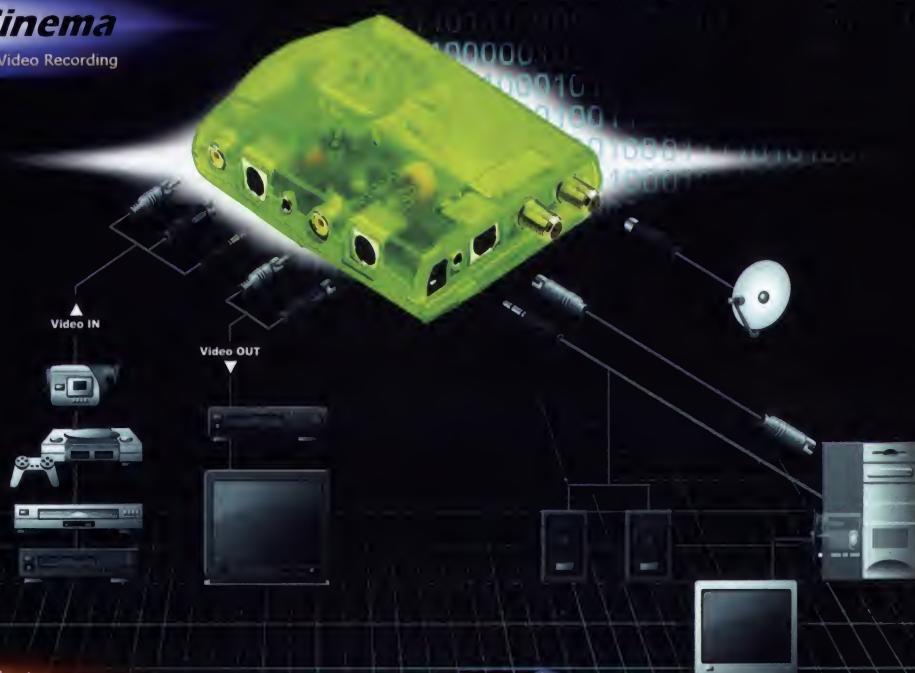
**Phone:** Anyware (02) 9879 5788 **Price:** \$95

**8.5/10**

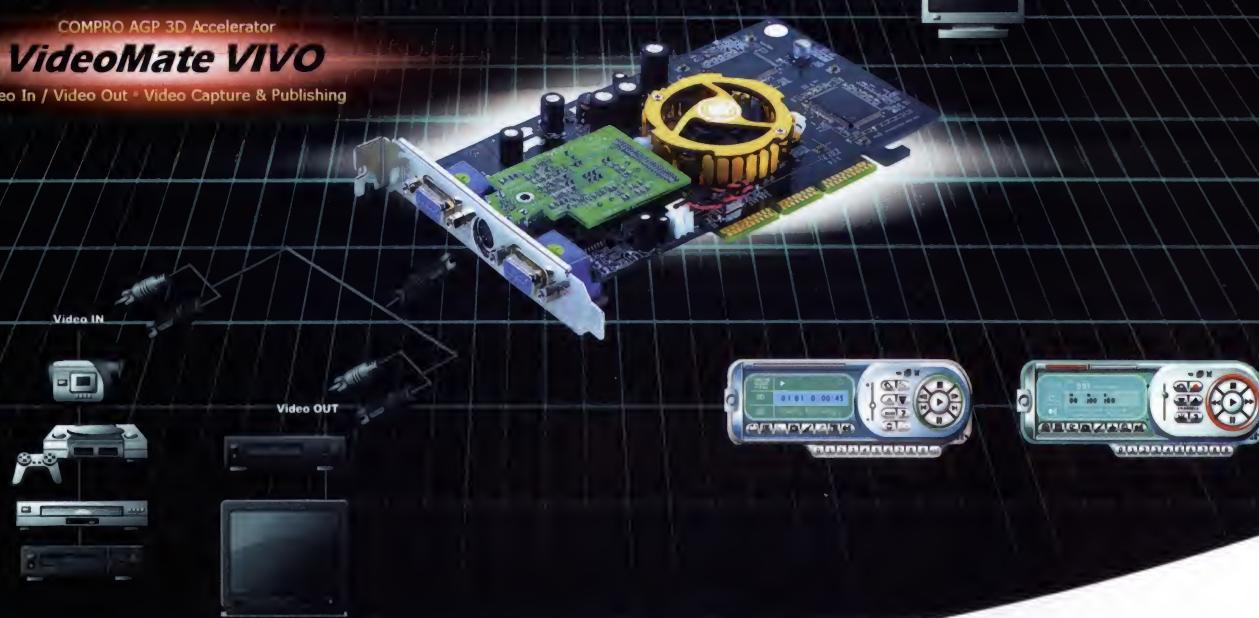
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## BenQ DVD GEM



The BenQ DVD Gem is a seriously cute device, which is not a whole lot bigger than a CD Walkman. It features a USB 2.0 external DVD-ROM and CD-ROM drive, DVD Player, and MP3 player, and is fitted with Composite Video and S-Video outputs for connection to a television set or projector

- the bandwidth capabilities of USB 2.0 also allow playback of DVD movies on your PC. This device has as much going for it as most mid ranged, full size, stand alone DVD players: it sports a DTS and Dolby Digital (AC-3) decoder, remote control, and the ability to play back DVD, CD, VCD, S-VCD, CD-R and CD-RW. It can operate as a standalone MP3 player, and is bundled with an infrared remote control and fitted with a headphone socket.

As an external data storage device, the DVD Gem performs flawlessly. For Win2K/XP users, installation is as simple as plugging it into a spare USB port, with no drivers or other utilities required.

It operates as a 24x speed CD-ROM and 6x Speed DVD-ROM

using USB 2.0 (with the option of Firewire) and is also backward compatible with USB 1.1 - although movies didn't play so smoothly and file transfers took considerably longer. We found a 1GB .vob file transferred from the device in 5min 14 sec - for an external data device, this isn't a shabby performer.

In terms of Composite Video movie playback on a television, the image wasn't as sharp as we might have liked, especially where colour tones are similar. Conversely, where there is high contrast, we saw the 'staircase' (jagged edge) appearance around the outlines of shapes.

The DVD Gem is marketed as a portable DVD solution, particularly for laptop users, but it still requires mains power to operate. Perhaps later models will support rechargeable batteries to provide even greater portability.

Bearing in mind the low price tag, we're impressed with the DVD Gem as a solution for those without DVD capability, both for movies and storage. Certainly for a PC, an IDE DVD-ROM drive would be cheaper, but in terms of an external, removable storage device, this is a solid offering from BenQ.

### SPECIFICATIONS

Formats: CD-Audio, CD-ROM, CD-ROM XA; CD-Plus, Video CD, S-VCD, Photo CD, CD extra, CD-R, CD-RW and DVD.

**Website:** BenQ [www.benq.com.au](http://www.benq.com.au)

**Supplier:** BenQ [www.benq.com.au](http://www.benq.com.au)

**Phone:** BenQ (02) 9714 6808 **Price:** \$399

7 /10

## Altec Lansing XA3021



The Altec Lansing XA3021 is a set of 2.1 speakers designed specifically for console gaming. Also in this range is the XA3001, which is the subwoofer only, and the XA3051, which is a more powerful set of 5.1s.

To test these speakers we sat down to a weekend of Xbox-powered gaming. Although not a high-end speaker system, it certainly packs a punch,

leaving the cruddy TV speakers that most console gamers may be used to with a lot to answer for.

Set up was a breeze as everything is nicely colour coded for connection to the rather intriguing looking subwoofer, which contains a 5.25in long-throw driver.

Apart from the interesting design of this system, the other thing that immediately fascinated us was the wired remote. At first, we were surprised that a standard infrared interface wasn't used, but on closer inspection of the remote, we found dual headphone sockets. Hence the wire back to the sub. The

ability to bung a set of headphones into a console game is a godsend to parents, partners and the gamers themselves, as playing Max Payne at a volume that doesn't rattle your windows just ain't quite the same.

As well as the headphone sockets, the remote has a volume control and three preset equaliser settings. While these equaliser buttons essentially control the bass output, the subwoofer is still fitted with a dial to set your own bass levels.

The sound delivered by the Altec Lansing XA3021 hardly puts this system in the high-end category: the bass was a tad hollow and lacking a decent punch, while the mid to upper tones were acceptable, but at the high volumes we all crave for, the sounds became distorted and unpleasant. When we played the system at more socially-acceptable volumes, sound quality was more than adequate, but we were disappointed that we couldn't turn the dial all the way up to 11.

Overall, these speakers are thoughtfully designed and the features are useful, particularly to gamers. However, you need to consider if the \$249.95 price tag is justified, given the other quality systems that sort of money can buy.

### SPECIFICATIONS

40 Watts (20 Watts RMS); Frequency Response: 35Hz – 18KHz; SNR: >76 dB; THD: < 0.2% @ -10dB.

**Website:** Altec Lansing [www.alteclansing.com](http://www.alteclansing.com)

**Supplier:** Innovision [www.innovision.com.au](http://www.innovision.com.au)

**Phone:** Innovision (03) 9855 1600 **Price:** \$249

6.5 /10



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17" Philips 107P Flat \$545	Sony 16x40 DVD \$95	IBM 20gb 2.5" \$235	Pragmatic External \$75	CAT5 RJ45 2m	APC UPS CS350VA	17" Flat Screen monitor
17" Samsung 753 \$320	Power DVD XP \$20	Maxtor 40g ATA133 \$155	Swansmart Internal 56k \$40	CAT5 RJ45 5m	APC UPS CS500VA	1.44 Mb Floppy Disk Drive
17" Sony E230 Flat \$530		Maxtor 60g ATA133 \$185	Swannsmart Turbo \$115	CAT5 RJ45 10m	APC UPS ES350VA	Asus GeForce2 Ti Deluxe
17" Viewmaster 0.27 \$250		Maxtor 80g ATA133 \$210		CAT5 RJ45 20m	APC UPS ES500VA	Sound Blaster Live De 5.1
17" Viewmaster Flat \$295		Seagate 40gb \$165		CAT5 Crossover 2m	Powerware 250va	Creative Inspire 2400
19" AOC 9GLR \$390		Seagate 60gb \$190		CAT5 Crossover 5m	\$180	Microsoft Internet Keyboard
19" AOC 9KLR FLAT \$495	4KUS 32X10X40 \$110	Seagate 80gb \$210		CAT5 Crossover 10m		Microsoft Intellimouse Optical
19" Hitachi Cm721 Flat \$650	4KUS 40X12X48 \$120	Western Digital 40gb \$165		CAT5 Crossover 20m		ATX Midi Tower 250watts
19" Philips 109B Flat \$595	Asus 48x16x48 \$195	Western Digital 60gb \$190		VGA RGB BNC Monitor		16x IDE DVD ROM
19" Philips 109P Flat \$835	LG 32x10x40 8mb buf \$115	Western Digital 80gb \$210		5.25 Power splitter		
19" Sony FD G420 Flat \$950	LG 40x12x48 8mb buf \$135	Western Digital 100gb \$330		Power Cable		
19" Viewmaster 0.26 \$390	LG Combo DVD/CDR \$160	Western Digital 120gb \$350		Power Extension		
19" Viewmaster Flat \$485	Liteon 40x12x48 \$125	Western Digital 120gb \$380		Parallel Printer		
21" Sony G520 Flat \$1765	Liteon 48x12x48 \$175	Western Digital 100gb \$380		USB Cable 2m		
21" Philips 201P Flat \$1695	MSI 40x12x48 \$125	Western Digital 120gb \$390		USB Printer 5m		
	Pioneer AVR04 DVDR \$790	5400RPM		USB Extension 2mb		
	Samsung 40x12x48 \$120	10gb Maxtor \$125		PS/2 2m Extension		
	Sony 40x12x48 OEM \$130	40gb Maxtor \$145		Monitor 2m Filtered		
	Sony 40x12x48 Kit \$225			Monitor 2m Extension		
LCD MONITORS	PROCESSORS	CASES & PSU	GRAPHICS CARD	CONTROLLERS	GAME DEVICES	UPGRADE OPTIONS:
15" AOC LM-500 \$720	Celeron1000A \$125	Aopen H400 \$125	Asus 64mb G42 MX400 \$130	Tekram DC15 SCSI \$50	Thrustmaster Joystick \$60	LITEON 32X10X40 \$135
15" Auniga 15ML \$770	Celeron 1.2ghz. \$145	Aopen H600A(300w) \$175	Asus V770GF2 DLX 64mb \$290	Tekram DC390U3W \$395	Thrustmaster Ff Joystick \$95	UPGRADE TO 19" ADD\$120
15" Hercules LCD \$895	P3-1.2 Tualatin 512k \$475	Aopen HQ45P4(250w) \$110	Asus V8440 GF4 128MB \$495	PromiseUltra ATA100Tx2 \$65	Thrustmaster Gamepad \$25	ADD WINXP HOME ED \$199
15" Hitachi 153XW \$850	P3-1.4 Tualatin 512k \$675	Aopen HQ45P4-PRO \$120	Asus V8460 GF4 128MB \$670	PromiseFTrackATA Tx2 \$220	Sidewinder GamePad \$45	ADD WINXP PRO \$330
15" Hitachi 155XW \$1095	Duron 1200 \$100	Aopen HQ08P4(300w) \$190	Hercules Aci AIW 8500DV \$660		Saitek Steering Wheel \$80	
15" Samsung 151S \$830	Duron 1300 \$115	Aopen HQ09P4(250w) \$110	Leadtek Winfast		Thrustmaster FF Strwheel \$195	
15" Hitachi 171XW \$1550	Retail Dym 3yr wty includes heatsink/fan	Aopen QF45(250w) \$110	GI2 MX-400 64mb TV \$130		Logitech Rumblepad \$75	
17" AOC LM-700 \$1295		Aopen QF50 Black \$150	GI4 Mx440 64mb TV \$190			
17" Auniga 17MVL \$1395		Aopen QF45P4 (250w) \$85	GI4 TH4200 64mb VIVO \$355			
17" Hercules LCD \$1330		Aopen KF45P4 (250w) \$85	GI4 Th4200128mb VIVO \$440			
PRINTERS	COOLERS	CASES & PSU	GRAPHICS CARD	CONTROLLERS	GAME DEVICES	UPGRADE OPTIONS:
Epson Stylus C20UX \$95	Duron 1200 \$115	Aopen H430D P4180w \$120	Asus 64mb G40 MX400 \$130	Tekram DC15 SCSI \$50	Thrustmaster Joystick \$60	LITEON 32X10X40 \$135
Epson Stylus C41UX \$115	Duron 1300 \$130	Aopen H450 P4 250w \$120	Asus V770GF2 DLX 64mb \$290	Tekram DC390U3W \$395	Thrustmaster Ff Joystick \$95	UPGRADE TO 19" ADD\$120
Epson Stylus C60 \$235	XP 1800+ \$185	Aopen H500 P4 250w \$130	Asus V8440 GF4 128MB \$495	PromiseUltra ATA100Tx2 \$65	Thrustmaster Gamepad \$25	ADD WINXP HOME ED \$199
Epson Photo 810 \$319	XP 1900+ \$215	Treetop Aluminium300w \$265	Asus V8460 GF4 128MB \$670	PromiseFTrackATA Tx2 \$220	Sidewinder GamePad \$45	ADD WINXP PRO \$330
Epson Photo 895 \$625	XP 2000+ \$235	InWin Q500N (300w) \$185	Hercules Aci AIW 8500DV \$660		Saitek Steering Wheel \$80	
HP Deskjet 656C \$99	XP 2100+ \$295	Lian-Li PC P5/Midi \$199	Leadtek Winfast		Thrustmaster FF Strwheel \$195	
HP Laserjet 1200 \$735	MP2000 \$440	Lian-Li PC12 Black \$265	GI2 MX-400 64mb TV \$130		Logitech Rumblepad \$75	
Panasonic Kx7100 \$465	Celeron 1.7G (478) \$185	Lian-Li PC60 USB \$295	GI4 Mx440 64mb TV \$190			
Xerox 3110 10ppm Laser \$420	Intel P4 1.8A \$340	Lian-Li P65+Window \$375	GI4 TH4200 64mb VIVO \$355			
SCANNERS	COOLERS	CASES & PSU	GRAPHICS CARD	CONTROLLERS	GAME DEVICES	UPGRADE OPTIONS:
Acer 4300 \$115	Duron 1200 \$115	Aopen H500 P4 250w \$130	Asus 64mb G42 MX400 \$130	Tekram DC15 SCSI \$50	Thrustmaster Joystick \$60	LITEON 32X10X40 \$135
Canon N676U \$175	Duron 1300 \$130	Aopen H500 P4 250w \$130	Asus V770GF2 DLX 64mb \$290	Tekram DC390U3W \$395	Thrustmaster Ff Joystick \$95	UPGRADE TO 19" ADD\$120
Canon D660U \$255		Aopen H600A(300w) \$175	Asus V8440 GF4 128MB \$495	PromiseUltra ATA100Tx2 \$65	Thrustmaster Gamepad \$25	ADD WINXP HOME ED \$199
Canon 1240U \$235		Aopen HQ45P4-PRO \$120	Asus V8460 GF4 128MB \$670	PromiseFTrackATA Tx2 \$220	Sidewinder GamePad \$45	ADD WINXP PRO \$330
HP Scanjet 2300 \$155		Aopen HQ08P4(300w) \$190	Hercules Aci AIW 8500DV \$660		Saitek Steering Wheel \$80	
HP Scanjet 4400 \$215		Aopen HQ09P4(250w) \$110	Leadtek Winfast		Thrustmaster FF Strwheel \$195	
HP Scanjet 4470 \$350		Aopen QF45(250w) \$110	GI2 MX-400 64mb TV \$130		Logitech Rumblepad \$75	
HP Scanjet 5400 \$390		Aopen QF50 Black \$150	GI4 Mx440 64mb TV \$190			
Epson 1250 \$195		Aopen QF45P4 (250w) \$85	GI4 TH4200 64mb VIVO \$355			
Epson 1250 Photo \$250		Aopen KF45P4 (250w) \$85	GI4 Th4200128mb VIVO \$440			
Epson 1650 \$330		Aopen P4533-E RAID \$160				
Epson 1650 SU Photo \$420		Aopen P4533-E RAID \$160				
SOUNDCARDS	COOLERS	CASES & PSU	GRAPHICS CARD	CONTROLLERS	GAME DEVICES	UPGRADE OPTIONS:
SB Live Value \$55	6cm Case fan \$15	Aopen P4533-E RAID \$160	Asus 64mb G42 MX400 \$130	Tekram DC15 SCSI \$50	Thrustmaster Joystick \$60	LITEON 32X10X40 \$135
SB Live DE 5.1 SE \$75	8cm Ballbearing fan \$15	Aopen P4533-E RAID \$160	Asus V770GF2 DLX 64mb \$290	Tekram DC390U3W \$395	Thrustmaster Ff Joystick \$95	UPGRADE TO 19" ADD\$120
Audigy DE SE \$160	9cm Case fan \$15	Aopen P4533-E RAID \$160	Asus V8440 GF4 128MB \$495	PromiseUltra ATA100Tx2 \$65	Thrustmaster Gamepad \$25	ADD WINXP HOME ED \$199
Audigy Platinum \$375	Memory Cooling kit \$25	Aopen P4533-E RAID \$160	Asus V8460 GF4 128MB \$670	PromiseFTrackATA Tx2 \$220	Sidewinder GamePad \$45	ADD WINXP PRO \$330
Audigy Platinum EX \$445	Orange Orb \$25	Aopen P4533-E RAID \$160	Hercules Aci AIW 8500DV \$660		Saitek Steering Wheel \$80	
Audigy Extigy \$320	Cystal Orb \$35	Aopen P4533-E RAID \$160	Leadtek Winfast		Thrustmaster FF Strwheel \$195	
Sound Muse 5.1 \$65	Antec Triniti Fans \$38	Aopen P4533-E RAID \$160	GI2 MX-400 64mb TV \$130		Logitech Rumblepad \$75	
Fortismus II \$85	Antec Blue LED fans \$35	Aopen P4533-E RAID \$160	GI4 Mx440 64mb TV \$190			
Leadtek Winfast 6X \$75	Antec Smart fans \$29	Aopen P4533-E RAID \$160	GI4 TH4200 64mb VIVO \$355			
SPEAKERS	MEMORY	KEYBOARDS	GRAPHICS CARD	CONTROLLERS	GAME DEVICES	UPGRADE OPTIONS:
Altec Lansing FLAT \$145	Coolermaster DP56H51 \$20	Acer AcuFeel Slim \$20	Asus 64mb G42 MX400 \$130	Tekram DC15 SCSI \$50	Thrustmaster Joystick \$60	LITEON 32X10X40 \$135
Altec Lansing 2100 \$240	Coolermaster HHC001 \$69	BTC 5199 \$15	Asus V770GF2 DLX 64mb \$290	Tekram DC390U3W \$395	Thrustmaster Ff Joystick \$95	UPGRADE TO 19" ADD\$120
Emcom 4.1 speakers \$85	Globalwin WBK68-II \$35	Fujitsu Internet \$35	Asus V8440 GF4 128MB \$495	PromiseUltra ATA100Tx2 \$65	Thrustmaster Gamepad \$25	ADD WINXP HOME ED \$199
Inspire 2400 \$95	Globalwin WBK38-II \$45	Logitech Internet Navigator \$75	Asus V8460 GF4 128MB \$670	PromiseFTrackATA Tx2 \$220	Sidewinder GamePad \$45	ADD WINXP PRO \$330
Inspire 4400 \$140	Volcano 6CU \$35	MSI K7266A \$15	Hercules Aci AIW 8500DV \$660		Saitek Steering Wheel \$80	
Inspire 5100 \$165	Volcano 6CU+ \$45	MSI K7266A \$15	Leadtek Winfast		Thrustmaster FF Strwheel \$195	
Inspire 5300 \$250	Volcano 7 \$50	MSI K7266A \$15	GI2 MX-400 64mb TV \$130		Logitech Rumblepad \$75	
Inspire 5700 \$685	Volcano 7+ \$65	MSI K7266A \$15	GI4 Mx440 64mb TV \$190			
Hercules XPS210 \$95	Volcano 9 \$65	MSI K7266A \$15	GI4 TH4200 64mb VIVO \$355			
Hercules XPS510 \$165	Dragon Orb \$25	MSI K7266A \$15	GI4 Th4200128mb VIVO \$440			
Logitech Z560-THX \$399	Cystal Orb \$35	MSI K7266A \$15				
Milford 240w \$15	Antec Triniti Fans \$38	MSI K7266A \$15				
Milford 650w \$40	Antec Blue LED fans \$35	MSI K7266A \$15				
Milford 750w \$50	Antec Smart fans \$29	MSI K7266A \$15				
Tsunami 180w \$15	Thermaltake Smartfan \$25	MSI K7266A \$15				
Tsunami 240w \$30		MSI K7266A \$15				
Yamaha TSS-1B \$395		MSI K7266A \$15				
CreativeSurroundstation75 \$75		MSI K7266A \$15				
MEMORY	KEYBOARDS	GRAPHICS CARD	CONTROLLERS	GAME DEVICES	UPGRADE OPTIONS:	UPGRADE OPTIONS:
Corsair XMS2700256mb CALL	Corsair XMS2700512mb CALL	Acer AcuFeel Slim \$20	Asus 64mb G42 MX400 \$130	Tekram DC15 SCSI \$50	Thrustmaster Joystick \$60	LITEON 32X10X40 \$135
Corsair XMS3000256mb CALL	Corsair XMS3000512mb CALL	BTC 5199 \$15	Asus V770GF2 DLX 64mb \$290	Tekram DC390U3W \$395	Thrustmaster Ff Joystick \$95	UPGRADE TO 19" ADD\$120
128MB Pci133 SDRAM \$75	128MB Pci133 SDRAM \$75	Fujitsu Internet \$35	Asus V8440 GF4 128MB \$495	PromiseUltra ATA100Tx2 \$65	Thrustmaster Gamepad \$25	ADD WINXP HOME ED \$199
256MB Pci133 SDRAM \$110	256MB Pci133 SDRAM \$110	Logitech Internet Navigator \$75	Asus V8460 GF4 128MB \$670	PromiseFTrackATA Tx2 \$220	Sidewinder GamePad \$45	ADD WINXP PRO \$330
512MB Pci133 SDRAM \$220	512MB Pci133 SDRAM \$220	MSI K7266A \$15	Hercules Aci AIW 8500DV \$660		Saitek Steering Wheel \$80	
Kingmax Pct2700 256mb \$165	Kingmax Pct2700 256mb \$165	MSI K7266A \$15	Leadtek Winfast		Thrustmaster FF Strwheel \$195	
Kingmax Pct3200 256mb \$195	Kingmax Pct3200 256mb \$195	MSI K7266A \$15	GI2 MX-400 64mb TV \$130		Logitech Rumblepad \$75	
Kingston p2100 256mb \$150	Kingston p2100 256mb \$150	MSI K7266A \$15	GI4 Mx440 64mb TV \$190			
Kingston p2100 512mb \$320	Kingston p2100 512mb \$320	MSI K7266A \$15	GI4 TH4200 64mb VIVO \$355			
Kingston p2700 512mb \$350	Kingston p2700 512mb \$350	MSI K7266A \$15	GI4 Th4200128mb VIVO \$440			
Samsung Pct2700 256mb \$165	Samsung Pct2700 256mb \$165	MSI K7266A \$15				
128mb Kingmax Sodium \$110	128mb Kingmax Sodium \$110	MSI K7266A \$15				
256mb Kingmax Sodium \$250	256mb Kingmax Sodium \$250	MSI K7266A \$15				
Click Black Keyboard \$25	Click Black Keyboard \$25	MSI K7266A \$15				
Mini Silver Keyboard \$65	Mini Silver Keyboard \$65	MSI K7266A \$15				
KEYBOARDS	GRAPHICS CARD	CONTROLLERS	GAME DEVICES	UPGRADE OPTIONS:	UPGRADE OPTIONS:	UPGRADE OPTIONS:
Acer AcuFeel Slim \$20	Aopen P4533-E RAID \$160	Arctic Silver 3 Tube \$20	Asus 64mb G42 MX400 \$130	Tekram DC15 SCSI \$50	Thrustmaster Joystick \$60	LITEON 32X10X40 \$135
BTC 5199 \$15	Aopen P4533-E RAID \$160	Copper Shim \$10	Asus V770GF2 DLX 64mb \$290	Tekram DC390U3W \$395	Thrustmaster Ff Joystick \$95	UPGRADE TO 19" ADD\$120
Fujitsu Internet \$35	Aopen P4533-E RAID \$160	8cm case fan \$9	Asus V8440 GF4 128MB \$495	PromiseUltra ATA100Tx2 \$65	Thrustmaster Gamepad \$25	ADD WINXP HOME ED \$199
Logitech Internet Navigator \$75	Aopen P4533-E RAID \$160	Digidoc 5 \$130	Asus V8460 GF4 128MB \$670	PromiseFTrackATA Tx2 \$220	Sidewinder GamePad \$45	ADD WINXP PRO \$330
MSI K7266A \$15	Aopen P4533-E RAID \$160	Standing Microphone \$10	Hercules Aci AIW 8500DV \$660		Saitek Steering Wheel \$80	
MSI K7266A \$15	Aopen P4533-E RAID \$160	Attec Lansing Headsets \$25	Leadtek Winfast		Thrustmaster FF Strwheel \$195	
MSI K7266A \$15	Aopen P4533-E RAID \$160	AHP5 \$25	GI2 MX-400 64mb TV \$130		Logitech Rumblepad \$75	
MSI K7266A \$15	Aopen P4533-E RAID \$160	AHP10 \$30	GI4 Mx440 64mb TV \$190			
MSI K7266A \$15	Aopen P4533-E RAID \$160	AHS20 \$35	GI4 TH4200 64mb VIVO \$355			
MSI K7266A \$15	Aopen P4533-E RAID \$160	AHS30 \$40	GI4 Th4200128mb VIVO \$440			
MSI K7266A \$15	Aopen P4533-E RAID \$160	Caselogic 24 cds wallet \$15				
MSI K7266A \$15	Aopen P4533-E RAID \$160	Caselogic 72 cds wallet \$65				
MSI K7266A \$15	Aopen P4533-E RAID \$160	Caselogic 88 cds wallet \$80				
MSI K7266A \$15	Aopen P4533-E RAID \$160	120 watts Speakers \$20				



# GAMES >>>

## A new kind of beast

We're soon due to see the release of some awesome online games. But at what cost, asks Bennett Ring?



Careful kiddies, there's a new beast wandering your darkened streets in the middle of the night, waiting to devour any and all bandwidth it can get its claws on. Not only does it have a desire to chew up your piddling monthly download allowance, it also has a taste for game servers, turning what were once perfectly reasonable pieces of server hardware into pathetic weaklings begging to be upgraded. This vile piece of code is the next generation of first person shooters.

Two examples of this hideous beast are already trawling our back alleys, bringing tears to the eyes of Optus and Telstra broadband users at the end of each month as they discover their 3GB download caps lying in a shattered heap. The uglier of these two creatures is easily Battlefield 1942, with America's Army coming in a close resource devouring second.

If you set BF1942's network settings to reflect your ADSL or cable connection, this amazing albeit hungry game is going to chomp through around 50MB of data every hour you play! To put this into perspective, Counter-Strike uses approximately five times less data, at around 10MB per hour. America's Army is quite happy to devour 25MB of data per hour – not quite up there with BF1942, but still a bandwidth razorback to be feared. With most broadband users limited to 3GB of downloads per month, this gives you approximately two hours of Nazi arse kicking each day of the month, providing you do absolutely zero net trawling or email downloading. That might be enough for your casual Saturday afternoon gamer, but for those of us who spend a large amount of our free time playing games, (I manage around four hours a night), something's gotta give.

Of course, if you play on your ISP's game servers, chances are you won't

be charged for the data downloaded within its network. However, unless hitting the rejoin button for hours at a time to get into a full server rocks your boat, you're going to end up playing on one of the dozens of other servers that aren't hosted by your ISP.

Don't go crying to the game developers when you get that \$1400 Net bill at the end of the month. To create these amazingly improved first person shooters, each with dozens of entities to keep track of, these games need to use high amounts of data. Instead we must persuade the big ISPs to ditch these ridiculous 3GB caps. Unfortunately all the methods I can think of (and have used in the past) for persuading large corporations to bend to my will are illegal, so I'm not allowed to list them here. However, if you email me I'm sure I can dig up something from my copy of *The Anarchist's Cookbook* (oops, that's also illegal).

Things are also looking grim on the ISPs' side. I spoke to Adam Williams (aka Term), the Product Manager for Telstra's GameArena. His server farm is comprised of around 32 different machines, each with an average setup of Dual 1GHz machines and 512MB of RAM, patched into Telstra's backbone via a 100Mbit link. Sure, dual one gig machines sound perfectly adequate to host a game server, and Term has quite happily had up to four, 20-player Counter-Strike servers on each machine in the past. However, a 24-player server BF1942 will quite happily chew up 50% of the CPU cycles on each of these machines, before spitting out the gutted remains and asking for more. I've heard reports that America's Army is even worse, gobbling up 100% of the CPU cycles on a 2.5GHz P4 server – ouch! So instead of 80 CS players per server, we're now limited to 48 BF1942 players or 20 America's Army players per server. Does this

mean Telstra is going to spend up big to double the number of servers to cater for the demand that BF1942 and America's Army are going to generate over the next few months? Of course it will, right after Elvis becomes the first astronaut to play golf on the Sun with the Wiggles for caddies.

When you consider that Telstra only updates its game server hardware roughly every 12 months, we can immediately see that there is going to be a severe shortage of suitable servers for these uber first person shooters come Christmas time. Even more worrying, from Adam's point of view at least, is the shocking stability and administration tools of the servers for these new games. Straight from Adam's mouth: '...dedicated server stability is a major concern – we have developed specific technology to deal with the problems in lack of stability of server software. . .' He then went on to say: 'The fact that we have even had to create this is seen as a big cause of concern to us, as we are increasingly being made to prop up poorly tested software with our own time. . .' So not only are these new game servers chewing up the lion's share of resources, they're also buggy jumbles of code just waiting to bring your precisely configured game server to a crashing halt.

So there you have it. While these new first person shooters are bigger, badder and just plain better than anything you've played online before, they don't arrive without their own set of unique problems. If you can think of a solution, I'll be waiting at [bring@atomicmpc.com.au](mailto:bring@atomicmpc.com.au) to send it on to the most influential developers I can pretend to know. Right after I finish my shift at the local sewerage reprocessing plant, where I'm working a second job to pay off the huge Net bill I got last month. . .

# The Sum of All Fears

Des McNicholas doesn't scare easily, so it will take more than this for him to feel the fear . . .



ABOVE: Outdoor locations are all the rage . . .



ABOVE: . . .but corridors are still en vogue . . .



ABOVE: . . .Ahh . . . the timeless mezzanine level!

**I**t's topical, well-crafted and nicely presented, but long-term fans of the Tom Clancy titles will still be a little disappointed with Red Storm Entertainment's *The Sum of All Fears*. Essentially *Rainbow Six* with the Ghost Recon engine, TSoAF takes the action back indoors, where players tackle a series of routine assassination, rescue and intelligence missions against a nuclear-capable terrorist organisation. In fairness, it comes at an expansion price, and TSoAF does offer some terrific action and a great introduction for new players. Add a strong multiplayer element and a very shallow learning curve, and it's a reasonable investment for those needing another dose of the great man's imagination.

TSoAF is an unashamed movie tie-in that will no-doubt earn Red Storm some very low-risk revenue. The 11 short campaign missions loosely follow the movie's basic premise – although most of the key characters are nowhere to be seen – with the FBI's Hostage Rescue Team (HRT) reacting aggressively to terrorists in the US and around the world. Each of the campaign missions can be replayed in firefight or lone-wolf modes, and players also have access to six new multiplayer maps. Red Storm's traditionally solid tutorial is included and the manual is well presented. A tailored Ubi.com interface is included for multiplay and, despite some reports to the contrary, no significant server or lag issues arose during the review.

Clearly hoping to capture new players inspired by the movie, Red Storm has

produced a very simple interface that will quickly see absolute novices cranking up victories. A host of player aids are available at the easy level, including auto-targeting and automatic heartbeat sensors, which result in an almost arcade experience that finishes the game in a couple of hours. It's a lot of fun and a great way to introduce new players, but it does wear thin and most players will be keen to try their hands against some real competition. The higher difficulty settings do have a fundamental impact on the experience, with more and smarter enemies, manual heartbeat sensors, no waypoint guides and the lack of auto-targeted sitting ducks.

Continuing the easy access theme, TSoAF puts virtually no emphasis on mission planning and preparation, relying instead on upfront action in every mission. After a Ghost Recon-style briefing, supported by intelligence summaries and target graphics, players get to choose the overall weapon-fit of their squad from a list of standard configurations. Despite the length of the list, the choice is essentially between silenced weapons and straight out assault, and whether or not sniper rifles and grenades will be used. No real planning is involved, and there's really not too much to separate the performance of the various weapons.

Although nothing along the tactical lines of Ghost Recon or Rogue Spear, TSoAF does bring some basic squad-play elements to lift it out of the FPS realm. Players command a three-person squad via a simple interface that

permits synchronised actions on opening doors and storming rooms, and the adjustment of group formations, stance and rules of engagements by shortcut keys or through an Operative Panel. The approach allows a little squad planning and means that the player doesn't have to open every door – it's nice to adopt a decent firing position while your off-sider takes all the risks for a change! Although other squads provide support in most missions, they're controlled entirely by the AI and their efforts can't be coordinated.

At its heart TSoAF is a competent rehash of the *Rainbow Six*/Ghost Recon mechanics, without the tense atmosphere of the originals. Mission transition is very abrupt, with virtually no use of cut-scenes, and the general level of sound effects is fairly average. Surprisingly, music plays a tiny role and the script and voice acting add very little to the game. The exterior graphics are excellent at times, but the interiors lack the lushness and attention to detail Red Storm is famous for and the environments are too similar to create a real feel of widespread operations. Still, there's no doubt that an average Red Storm title still stands out from the crowd, and *The Sum of All Fears* is a solid introduction to squad-based action.

7.5/10



## GAME DETAILS

**FOR:** A proven system, some basic squad-play elements and good multiplayer.

**AGAINST:** Lack of atmosphere, average AI, and too many outward opening bloody doors!

**REQUIREMENTS:** PII 450; 128MB RAM; 1GB HDD; 16MB DirectX video – Voodoo not supported.

**RECOMMENDED:** PIII 450; 128MB RAM; 32MB video card.

**SOUND APIs:** Direct Sound **VIDEO APIs:** Direct3D

**DEVELOPER:** Red Storm Entertainment [www.redstorm.com](http://www.redstorm.com)

**PUBLISHER:** UbiSoft [www.ubisoft.com](http://www.ubisoft.com)

**DISTRIBUTOR:** UbiSoft [www.ubisoft.com](http://www.ubisoft.com)

**PHONE:** UbiSoft (02) 8303 1800



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# Delta Force: Task Force Dagger

Des McNicholas is back from a tour of duty in Afghanistan and he's not happy.



ABOVE: This game is a sniper's paradise. . .

Novalogic has had great success with the Delta Force series over the last few years, choosing to focus on lower cost action titles rather than gritty realism. It's an approach that has seen the growth of a strong fan base and a lot of online support, despite the fact that DF3 didn't live up to expectations in single-player mode. While Delta Force: Task Force Dagger is just as accessible as its predecessors, fans will be disappointed with the small number of improvements and the pedestrian range of missions on offer. The price is right, but in many ways it's just a quick expansion to join the 'War on Terror' bandwagon. That said, it's still a good introduction to military FPS games and multiplayer is excellent.

Dagger puts players into the role of a Delta Force soldier behind enemy lines in Afghanistan. Nine other Special Forces are also represented, including the Navy Seals, the Green Berets and the Australian SAS. Each force is given unique abilities, such as weapons accuracy, swimming or sniping, and each has a preferred weapons fit. The campaign brings 25 loosely related missions, all of which can be played in any order, and a basic tutorial gets things quickly underway. Multiplay is exceptionally well supported on NovaWorld, and up to 16 players can fight it out via LAN. A decent mission editor is included, as is Novalogic's traditional keyboard template.

Mission briefings in Dagger are quick and simple, with final instructions coming in by



ABOVE: . . .It has airborne sniping. . .

radio as you hit the infiltration point. Most missions are standard search-and-destroy affairs, although the odd rescue and intelligence job adds some spice, and night actions are very well handled. Unfortunately, things play out in pretty much the same way throughout the campaign: drop in a few hundred metres from the objective; take out the remarkably dumb patrols using a sniper scope; shoot the guards in the towers; enter the compound; and blow everything up. Players are given a free run on choosing routes and the timing of their attack, but the process quickly becomes repetitive, particularly as no real effort is made to boost the atmosphere with music or cut scenes.

Novalogic has always delivered in the gadget stakes, and Dagger is no exception. 30 weapons are available, including sniper rifles, the devastating OICW Assault Rifle, pistols, grenades and air-strikes; and players can change kit at conveniently positioned armouries on most single and multiplayer maps. DF2 introduced the famous remote camera and Dagger goes one step further by shipping with an Unmanned Aerial Vehicle. The UAV circles overhead during missions and players can take direct control of the camera to get a bird's eye view of the target and surrounding area. It's a terrific innovation that captures the role of technology in modern warfare, although much of the information is already available on the all-seeing GPS map.

Dagger has a very clean onscreen interface that neatly shows location, wind



ABOVE: . . .and close-quarters sniping too!

direction (important for sniping), stance, and equipment information. The GPS mini-map is essentially radar that shows friendly and enemy troops, buildings, vehicles, objectives and waypoints, and a Commander's Screen can be called up to hone in on the detail.

Movement controls are straightforward, the default keyboard layout is well designed, and changing or selecting equipment is a breeze. Novalogic has stuck with the existing Delta Force engine, resulting in graphics that are starting to look very dated and some problems with discerning targets in open terrain. The upside is fast play on a relatively low-end system, although the game has a very empty feel about it in both open terrain and built-up areas.

Dagger is a 'through-the-motions' addition to an excellent series. It's easy to learn and the missions are topical, but serious players will be disappointed with the general lack of innovation and the dated engine. Stronger AI and more effort on the general atmosphere would help, as would some basic squad elements and a more engaging storyline. The multiplay experience remains first-rate – particularly Last Man Standing – but we had that already and this is not the major overhaul the Delta Force franchise needs.

**6.5/10**



## GAME DETAILS

**FOR:** An essentially good interface and very solid multiplay. UAVs!

**AGAINST:** Very bland look (even for a desert!); nothing really new; and poor enemy AI.

**REQUIREMENTS:** PII 400MHz; 64MB RAM; 200MB HDD; 32MB DirectX video, 3dfx not supported.

**RECOMMENDED:** PIII 450MHz; 128MB RAM.

**SOUND APIs:** Direct Sound **VIDEO APIs:** Direct3D

**DEVELOPER:** Novalogic [www.novalogic.com](http://www.novalogic.com)

**PUBLISHER:** Electronic Arts [www.ea.com](http://www.ea.com)

**DISTRIBUTOR:** Electronic Arts [www.ea.com](http://www.ea.com)

**PHONE:** Electronic Arts (02) 9264 8999

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# The Thing

Bennett Ring plays hard with John Carpenter's Thing.



ABOVE: The game is full of gore

John Carpenter's *The Thing* was one of the most highly acclaimed horror films of the early 1980s, arguably creating a sense of paranoia that hasn't yet been matched. It also happens to be one of the goriest movies this side of an R rating. Fast forward twenty years, and we now have the sequel to this open-ended movie in the form of *The Thing* game for Xbox, PS2 and PC.

As the game is a direct sequel to the movie, it's a good idea to watch the flick before you delve into the Antarctic landscape in search of the remnants of Kurt Russell's career. If you don't, you won't appreciate many of the references to the movie throughout the game, and the overall mess-your-pants factor will be much lower.

Unfortunately for the PC version, its console pedigree shines through loud and clear. Using the same third person perspective as Max Payne, the mouselook in *The Thing* is bizarrely crippled. You can look left to right, but not up and down, unless you use the first person view, in which case you can't move. This isn't too much of a problem when it comes to combat, as your character auto-aims the Things into oblivion, but it would have made exploration much simpler. The game's graphics also show the simplicity needed to make it run smoothly on the consoles, although it's by no means ugly. Character model detail is impressive, and somehow the developer has managed to capture the eerie atmosphere of the original film sets with minimal polygons. A beneficial



ABOVE: You don't want to see what happens next . . .

side effect of these relatively simple graphics is that the system requirements are quite low when compared to the latest and greatest DirectX 8 chugorama slideshows.

As far as gameplay goes, *The Thing* sticks to the tried and true survival horror genre spawned so many years ago with the *Alone in the Dark* series. Which means you'll spend a lot of your time going from point A to point B, with a few dozen creatures in between you and your objective. Occasionally you'll need to find a key or repair a circuit box to open the door in between you and your final destination. However, there is a major innovation that sets this game apart from the few other PC survival horrors around: squad management. Instead of just having to worry about saving your own arse, at times you'll have up to three other squad mates to baby sit. The AI for these guys is impressive, as they'll do exactly what's required of them 99% of the time. This includes activating switches, and the ever important covering fire – aka blowing shit up.

What's even more unique is the fact that you don't know if any of your teammates are actually *The Thing*, unless you happen to find a blood test kit lying around. So you could find yourself in the middle of a firefight when the guy you just gave your last clip of ammo to suddenly decides to rip both his arms off and morph into a blood guzzling, brain chomping Thing. Just like the movie, this gives the game a huge boost of suspense, as you never know who or what you can trust.



ABOVE: The loveable dog Thing from the movie

This feeling is reciprocated by your cowering teammates: each has a trust meter that is influenced by what you do in the game, so if you give them a big arsed gun they'll love you forever; but pop a cap in their knee and they'll start thinking you could be infected. If they lose all trust in you they're likely to try and flambé you as soon as you turn your back, but if they think you're trustworthy than their own mother, they'll stick by you through thick and thin.

*The Thing* has a couple of significant flaws that detract from the overall enjoyment of the game. The biggest problem is the vagueness of your objectives: at times you'll fumble around in the dark for an hour or so until you figure out what to do. Another concern we have is that the numerous scripted scenes are a little too obvious. Finally, the game comes off feeling very console oriented, from the menu options all the way through to the gameplay.

Don't get us wrong, *The Thing* is a blast, provided your idea of fun is being terrified out of your wits and having nightmares about the level you completed just before going to bed. But due to its cross platform nature, it's more likely to receive critical acclaim on the consoles than the PC.

8/10



## GAME DETAILS

- **FOR:** Creepy, kooky and altogether spooky; great storyline carries on from the movie.
- **AGAINST:** Plays like a console game; simplistic graphics; vague mission objectives.

**REQUIREMENTS:** 400MHz CPU; 64MB RAM; DirectX 8-compatible video card.

**RECOMMENDED:** 800MHz CPU; 128MB RAM; GeForce2 or better.

**SOUND APIs:** Direct3D **VIDEO APIs:** Direct Sound

**DEVELOPER:** Black Label Games [www.thethinggames.com](http://www.thethinggames.com)

**PUBLISHER:** Vivendi Games [www.vugames.com](http://www.vugames.com)

**DISTRIBUTOR:** Vivendi Games [www.vugames.com](http://www.vugames.com)

**PHONE:** Vivendi Australia (02) 9902 7728

# Medieval: Total War

David Kidd wipes out the French. Over and over and... encore une fois.



ABOVE: A peaceful castle and...

**Medieval: Total War** is Creative Assembly's follow-up to the smash strategy title, **Shogun: Total War**. Shogun's combination of a deeply complex, turn-based strategy game with large-scale real-time battles rejuvenated both genres of PC strategy in one fantastically executed title. But after those crazy Mongols invaded Japan in an expansion pack there wasn't much left for Japan except a rather well known war ending with an atom bomb. So Creative Assembly took the same model and injected it straight into the main vein of racial tension: the European Middle Ages.

What has become one of the top strategy series of all time, the **Total War** formula features two very different games rolled into one: Risk-style turn-based strategy and the massive clash of armies in real-time strategy mode. Shogun proved both could've been released individually and players wouldn't have felt either game was a lesser title.

Medieval's turn-based mode, like Shogun, takes you through a full historical campaign, leading one of twelve factions through the early, middle or late eras of the Middle Ages. The campaign offers far more variety than Shogun's Japan: as the game takes place across the whole of Europe and the Middle East there's much variation across the national borders in unit type, terrain and, naturally, religion. As in Shogun, religion plays an important role with alliances where, for example, a continued war against a fellow Catholic nation will result in excommunication by the Pope – he prefers that you smack Muslims around instead. Trade also plays an



ABOVE: ...sixteen mangonels equals...



ABOVE: ...two thousand corpses

important role and acquiring new territories opens up more sources of revenue. Every so often you get a Princess unit that you can marry off. Not only does this strengthen alliances, it also lets you take some territory should your ally get wiped out.

While the campaign mode is solid, Medieval really takes off in battle mode. The sheer number of troops in the field can be overwhelming but don't be fooled by the 'up to 10,000 troops at once' feature on the box – the reality is you only have direct control over 16 squads that consist of over a hundred units. Knowledge of flanking, ambushes, cavalry charges and the bait-and-switch are all vital in order to defeat the much-improved AI reacting to your every move. Logic is also important: guns don't work too well in the rain; archers on top of a hill will fire further; and cavalry charging downhill will absolutely freak the enemy out. Morale is emphasised, with troops getting tense or running away if their flanks are unprotected or their mates turn into pincushions.

Aside from a few tweaks to group formations and a wider array of units than Shogun, the real difference comes from artillery and siege weaponry. The sight of trebuchets, cannons and catapults firing over hundreds of metres before flattening the enemy cannot be understated. But while massive flying stones are great against waves of infantry, they're even better against castles, and here Medieval improves upon Shogun's mediocre storm-through-the-front-door approach. Accuracy depends on range

and it's common to see a stone miss a wall, fly over the top, bounce along the ground and punch a hole in the cowering French soldiers.

If you're playing the campaign mode, the battles are directly influenced by the decisions made on the top of the table. If you've built a castle, a keep and two rows of stone walls, then – should you piss off the French too much and they invade – you'll be defending that same castle. This tiered approach is the greatest strength of Medieval, but it's also a major hindrance. After hours of playing and thinking on such a macro-level you'll soon be habitually clicking the auto battle button to preserve the rhythm.

This is only a minor gripe involving personal style rather than a fault in the game. In fact, as with Shogun, Medieval provides plenty of playing options without diluting the experience – there's enough here to satisfy hardened wargamers, history buffs or casual RTS gamers. The graphics, interface, sound and cut-scenes build upon Shogun's high standards, and if your PC can handle it, you'll be flying over some of the best battle scenes in any PC game for the next few years. Medieval has much to live up to, and the amount of depth and replayability more than adequately carry on Shogun's legacy. □



## GAME DETAILS

- **FOR:** Massive, complex and detailed – every strategy gamer **MUST** have a copy.
- **AGAINST:** It chugs in large-scale battles and the AI still needs some work.

**REQUIREMENTS:** Athlon/Pentium III 1GHz; 128MB DDR SDRAM; GeForce2 MX

**RECOMMENDED:** Athlon XP/Pentium 4; 256MB DDR SDRAM; GeForce3

**SOUND APIs:** DirectSound **VIDEO APIs:** Direct3D

**DEVELOPER:** Creative Assembly [www.totalwar.com](http://www.totalwar.com)

**PUBLISHER:** Activision [www.activision.com.au](http://www.activision.com.au)

**DISTRIBUTOR:** Activision [www.activision.com.au](http://www.activision.com.au)

**PHONE:** Activision (02) 9869 0955

9  
10

# Hunter: The Reckoning

It's time to go on patrol with Bennett Ring.



ABOVE: Shazam! Begone foul beasts!

If you genetically crossed the classic games Gauntlet and Resident Evil within the lab you bought from Dr Moreau on eBay, the hideous offspring would bear a striking resemblance to this game. This is not a bad thing, as the Xbox is severely lacking in games where dismembering/decapitating the opposition is a primary function of the gameplay. You play the role of one of four Hunters on a quest to rid the town of Ashcroft of the demonic forces now wreaking havoc on its virginal citizens. In other words: you're a party pooper.

Hunter is played from an isometric perspective, and uses a control system very reminiscent of that found in the Contra series of games. One analog stick controls the direction you are running (and trust us, you will be running, not walking), while the other analog stick controls the direction you face. It takes a little getting used to, but you'll soon be smiting the hordes of undead with ease.

Each hunter is blessed with three different modes of dealing out the hurt: melee (axe/sword) attacks for when you want to see the whites of the eyes you're about to poke in; ranged (gun) attacks for those times when you don't want to get blood splatters on your freshly dry-cleaned hero costume; and finally Edge (magic) attacks, to be used only when the odds of survival are looking decidedly slim. Each of the four characters specialises in different areas, such as speed or spell casting, and as a result you'll have to adjust the way you play the game depending on which character you choose. These stats



ABOVE: No, that's not red spray paint. . .

increase as you play the game, depending on which attacks you use most. Cool huh?

Sound is very important in a game that tries to elicit a fresh coating of smogged in your undies every time you play, and Hunter delivers the blood soaked goods in this regard. The music is suitably terror inducing, and even goes into overdrive when the blood is about to flow, although this feature is a little buggy, with it activating at incorrect moments. If you've got 5.1 Dolby Digital you'll find zombie slaying to be much easier – often the bad guys will be off screen but you're still able to pump them full of shotgun pellets by aiming in the direction of their screams.

Each Hunter is highly detailed and well animated, while the levels are for the most part stunning with reflective and bump mapped surfaces. Water effects are especially impressive, as is the real time lighting. Oh yeah, there's more than a little bit of gore in this game. You can hack off limbs, heads and even torsos, leaving a pair of legs chasing you down the road. After a battle, you'll find the ground literally covered with blood, making it easy to keep track of where you've been. While these graphics are very impressive, the engine shows its strength when you've got four Hunters on screen facing off against thirty or so enemies. The phrase 'manic axe frenzy' springs to mind.

While Hunter can be played solo, it's really designed to be played by four players. If you're lucky enough to know three people you can convince to trust you enough to enter



ABOVE: A small battle compared to most in Hunter

your abode for a multiplayer session of Hunter, you're in for a treat. Tearing through a couple of hundred decaying corpses has never been so much fun. Co-ordination is a must, or else one of you will suffer the old 'Get your arse over here, I'm stuck at the edge of the screen!' routine that Gauntlet lovers will know so well. Pity the fool who dies the most, as they'll have to suffer the wraith of the other three as they chew through the shared lives.

This game came so close to getting an *Atomic* Hot Award that we could almost taste its brain matter. Unfortunately there are a couple of niggling concerns that prevent us from dishing out the loving to this extent. First up is the game's length: at around a mere ten hours you'll finish it quite quickly, although it's so much fun you'll keep playing it with pals for months to come. Then there's the pathetically easy ending: after working so hard to make it to the final boss you can't help but expect more.

While it's not quite Hot Award material, Hunter is still a damn fine game. If you've ever watched a creature feature and thought how cool it would be to be the guy whose intestines are now doubling as vampire tooth floss, you simply can't miss this title. □

**8.5/10**



## GAME DETAILS

**FOR:** Luscious visuals; manic action; terrifying atmosphere; amazing four player multiplay; and slabs of gore.

**AGAINST:** Short overall length; not so fun when played solo; can get quite repetitive; and the end Boss is crappy.

**DEVELOPER:** High Voltage Software [www.high-voltage.com](http://www.high-voltage.com)

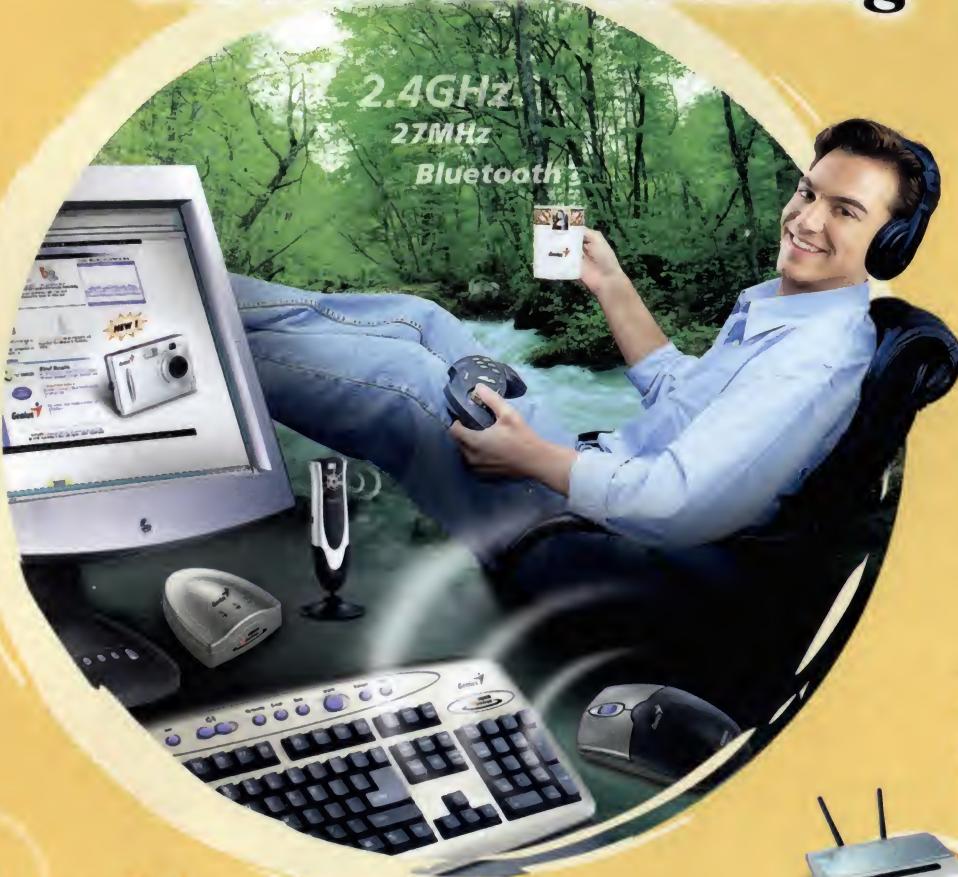
**PUBLISHER:** Interplay [www.interplay.com](http://www.interplay.com)

**DISTRIBUTOR:** Vivendi [www.vivendiuniversal.com](http://www.vivendiuniversal.com)

**PHONE:** Vivendi (02) 9902 7728

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# Techanimosity

Daniel Rutter is like a technical agony aunt. He even looks vaguely 'auntieish', in an uncley sort of way. But enough childhood flashbacking for the moment. Following is the lastest batch of Daniel helpees. IOOTM this round has won the Logitech (02 9972 3711, [www.logitech.com](http://www.logitech.com))

Dual Optical mouse, featuring red LEDs.



## i IOOTM: Mouse modding

After a failed attempt at a mouse mod (cheap spray paint rubs off) I found it was time to buy a new mouse. At a local swapmeet I noticed an optical mouse with a blue plastic rim, and I thought it might be a new blue light optical mouse. WOW, what do ya know? It was the plain old red crap! After that I have become rather intrigued with modding it to a blue type. Without knowing any of the internal workings of the mouse I was wondering: can I just replace the red light with a blue one? Or do I have to drown out the red with additional blue lights?

Sean Hubbard

**O** Surprisingly enough, you probably can just swap in a blue Light Emitting Diode (LED). All you have to do is unsolder the high intensity red LED the mouse uses to light up the surface under its little camera chip, and replace it with a blue one, which you can buy from any half-decent electronics store.

If you get the new LED the wrong way around it won't light up, and there are of course many things you can destroy once you start poking around inside your mouse with a soldering iron. But if you've got some basic soldering skillz, you should be fine.

Blue and red LEDs need different voltages for a given current flow, but you can generally just swap a blue one in where a red one was and get an OK amount of light.

Some mice simply don't work right after this mod, presumably because their optical pickups don't have good sensitivity to blue light or can't focus it properly. But quite a lot of mice seem to deal with the change just fine, as long as there's a decently contrasty surface under the mouse for it to look at.

Mice that have translucent red baseplates – like Microsoft's IntelliMouse Explorer series – won't look great with blue LEDs, because not much light will make it through the red plastic. If you've got a mouse with grey or blue translucent trim, though, it'll probably glow brighter with a blue LED than with a red one.

And if you've got a mouse that has extra LEDs used just for decoration, then you can replace those extras with anything that'll run from about the same voltage and current, without affecting the mouse's performance at all.

## i Pushing a P4

I have one of the P4 1.6GHz processors that you reviewed in issue 18 and was wondering which would be the best method for overclocking it with a VIA P4XB-M motherboard. I think this motherboard supports manual changes to the clock frequency and the multiplier – which would be better to change?

I'm using PC-2100 DDR RAM and an AGP 4X graphics card. I am wondering, will increasing the FSB to 133MHz affect these components?

Kek Tang

**O** The CPU's Front Side Bus (FSB) frequency is what you should change, because that's all you *can* change. Like all other retail Intel CPUs since the steam-driven days before the Pentium III, your P4 has a locked multiplier, so changing the multiplier setting will achieve nothing.

As your motherboard lacks the ability to independently set frequencies for the CPU and other buses (well, that's what the manual I just downloaded says, anyway), increasing your CPU's FSB speed will increase the bus speed for your other components by the same amount. They'll tolerate some amount of overclocking, and may not even be the limiting factor; because your motherboard doesn't have CPU voltage adjustment, it's possible you'll run out of CPU overclockability before you hit the limit for anything else.

## i What's that sucking sound?

I am a big fan of SETI@home. (YAY Team AtomicMPC!) As a result of this addiction, I have accumulated four PCs to run SETI on. These PCs are left running 24/7 in my home prefecture and so far nothing has burned down. Just the other day though, the electricity bill arrived and surprise, surprise, it's higher than a kite.

Instantly the parents blame me and my flagrant use of electricity, but I am wondering if the blame lies on me or not. I think two of the machines have 250watt power supplies, one has a 200watt, and the other has a 350watt. But surely these machines do not consume all that power ALL the time? Your reply will be used in my case against my parents, who are currently extracting repayment from me in the form of domestic duties.

Darrkon

**O** No, they don't. The PSU rating is the total amount of power the PSU can deliver when it's fully loaded. It's like engine power ratings: your car may have a 150kilowatt engine, but you're not using 150kilowatts while you trundle around the supermarket car park.

Well, OK, if you like your handbrake and hate your tyres, maybe you are. But let's continue anyway.

How much power your PCs actually consume depends on their specs. A range from about 50 to about 150watts is ballpark plausible.

If your power tariff is 10.68 cents per kilowatt-hour, and your four computers are consuming an average of 100watts each, then they're costing a hair more than a buck a day to run, between them.

### i Wondering about wireless

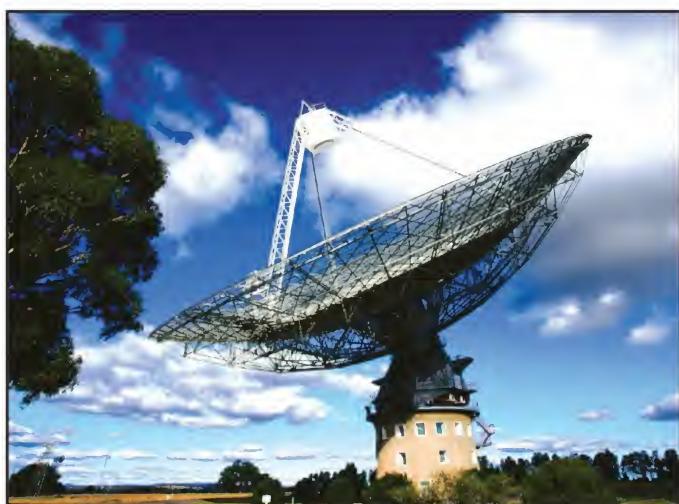
OK, I have just read the wireless feature in *Issue 19* and got all excited.

Oh my various gods! I could set this up between here and my friend's house, right now! I could best him in Jedi Knight 2, but then interfere with the connection afterwards so we can't play HOMM4! Also, I wouldn't have to lug my old 1GB hard drive around there every time he needs the latest patch/MP3/freeware app.

So I checked the links provided and the idea began to lose some of its steam. I came away with more questions than I started with. Namely:

1. Although I'm fairly sure I can see his house directly from my window, there are three power lines and the odd tree crossing the view. Do you think this going to affect the quality of the signal?
2. We are in a small town on the mid West coast. Hence there are no local meshes made up of helpful individuals around here, unlike Perth for example. Is wireless really the best option for this sort of point-to-point networking?
3. The costs for 802.11b network cards don't seem too bad, but the messing around involved with setting up and or making dishes/antennae seems a bit much. Is there a simpler way for us lazy folk?
4. Will the Government be able to monitor our traffic? Just in case we happen to transfer some highly confidential 'educational' materials. Not that we would, of course.

Tom Butler



ABOVE: Homebrew 802.11b antennas are easy to build. Here's one I made earlier, from a colander and three coat hangers.

**O** If you've got line of sight to your destination and you're within, say, potato-cannon range, then you won't need super-fancy antennas, though you *will* need something better than the little 'rubber duckies' that come with many WLAN cards. This, of course, means that you should buy cards that have a proper antenna socket on them, not ones with the antenna built into the card.

A power line or two won't be a problem. Trees are a problem, though; 802.11b uses the 2.4GHz spectrum, which is eaten quite efficiently by anything with water in it. Trees, people, monsoons – all pretty much opaque. One straggly little sapling shouldn't be a problem; Sherwood Forest definitely would. You pays your money and you takes your chance.

Is a WLAN the right solution? Pretty much, yes. People have been known to do naughty things like run network cables through drains, and hobbyists have been fooling around with radio modems and laser links and so on for ages. But commercial WLAN gear with simple homebrew directional antennas is now a straightforward enough proposition that you don't have to be a propellorhead to make it work, over moderate distances.

If you don't want to make your own antennas, you don't have to. Just spend more money. There are lots of plug-and-go 2.4GHz directional antennas on the market, and you can get a fair few of them in Australia.

Tin-can directional antennas really aren't hard to make if you just follow someone else's recipe. Check out the Antenna category at ([www.sydneywireless.com](http://www.sydneywireless.com)) for some Australia-specific reception info.

If you can make a water pipe out of an Orchi bottle, and you can't make an 802.11b antenna out of a Pringles can, then I want to know why.

OK, it's probably got something to do with the water pipe. Never mind.

Will The Man be able to monitor your traffic? That depends on what sort of traffic it is.

Set up a vanilla WLAN with authentication by just the basic Service Set ID (SSID) and channel number, and any schmo passing by can unfold his iBook, passively sniff your traffic to find the connection data in seconds, and then be as connected to your LAN as he would be if you'd hung a 100BaseT lead out of your window for his convenience.

Wired Equivalent Privacy (WEP) is the better-but-still-not-good WLAN security system that's supported by everything half-decent on the market today. Unfortunately, it's defeatable by anybody willing to record some of your network traffic and analyse it later, or just sit on a hilltop pointing a high-gain antenna at your house and do it live. It takes a while, but you don't need a supercomputer to do it.

For serious security you'd have to implement a system like IPSec or NoCatAuth, that seriously encrypts everything sent over the airwaves. You're not going to be doing that, on your simple Windows network. You could use the Virtual Private Network (VPN) features in the current Windows flavours, but you'd want a couple of dedicated boxes to handle it properly.

Now, if you use Win2000 or WinXP on every box that shares anything with the network, and set up proper password-protected user accounts, and don't run 362 P2P servers and stick up signs on telegraph poles that say 'G37 YO W4R3Z H3R3', then your network resources should be safe. It's not as if the BSAA is trundling around the country in detector vans.

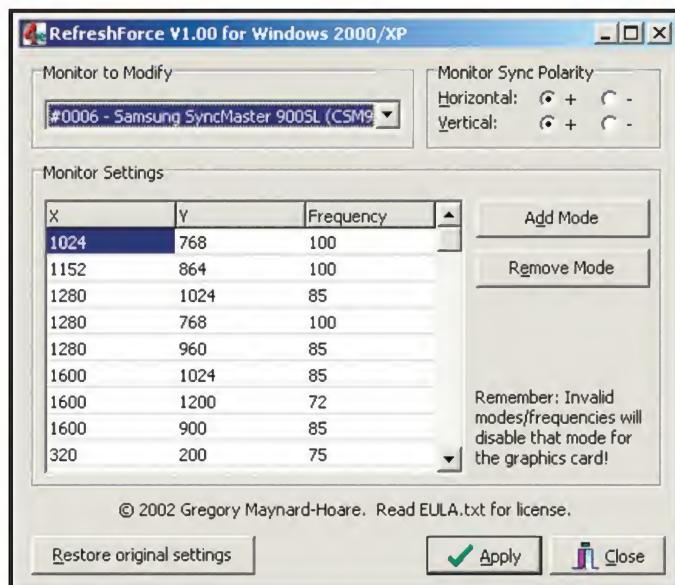
But if you want really serious security, then no, you're not going to get it from an ordinary WLAN setup.

## i Frequency fiddling

I have a 20in SUN multi frequency monitor, which I recently got fairly cheap. The problem is that it only supports a limited number of resolution and refresh rate combinations. This is no problem for the Windows desktop, because I can change those settings in the Display Properties. The problem is that some games change the resolution or use the default refresh rate, which scrambles the display on this monitor.

Is there any way I can specify what refresh rates to use at any particular resolution, independent of how or what program or driver version changes the resolution? I am using a GeForce3 with 64MB RAM, and the latest release NVIDIA detonator drivers.

Simon Strudwick



ABOVE: Microsoft couldn't get refresh rate control right in Win2000 and WinXP, but you can.

**O** Yes, this problem is solvable. It depends on which Windows version you're using, but if you've got this problem, I presume you're using Win2000 or WinXP, because Win2000 introduced this particular piece of Microsoft brilliance, and WinXP hasn't cured it.

RefreshForce ([www.pagehosting.co.uk/rf](http://www.pagehosting.co.uk/rf)) or the older RefreshLock ([www.pagehosting.co.uk/rl](http://www.pagehosting.co.uk/rl)) will solve your problem.

## j CD-RW on 'twok

I bought a Toshiba laptop (Celeron 1.2GHz, Windows XP) and wanted a CD writer, so I went out and bought a PCMCIA FireWire card, an external case and a Lite-On 32x10x40 CD writer.

After a short hardware assembly session, I plugged in the PCMCIA card with the external writer attached to it and the notebook recognised the PCMCIA card and the presence of an external CD drive, however when I clicked on the properties of the drive, it didn't state that it is a CD writer.

I installed Nero Burning ROM, which came with the writer, and restarted my computer. When I tried to load Nero, the program stopped responding at the screen where it says something like 'Initialising SCSI/IDE Device'.

I am really desperate and would really appreciate it if you could solve my little problem.

Ethan Tay

## o

Not only does WinXP not recognise the writer – you'll probably find that no other Windows flavour will work with it, either. Some external IDE-to-FireWire boxes do this.

There is no cure that I know of. Whether a given FireWire box will have this problem or not depends, I think, on the bridge hardware the box uses – the chip that does the command language translation. All of these boxes, even the oldest and cheapest and crustiest of them, will work fine with a hard drive, or a CD-ROM drive, or even a CD writer, as long as you're only using the writer to *read* discs. But only the better external boxes will let you use a CD writer properly.

What are 'the better external boxes'? Search me.

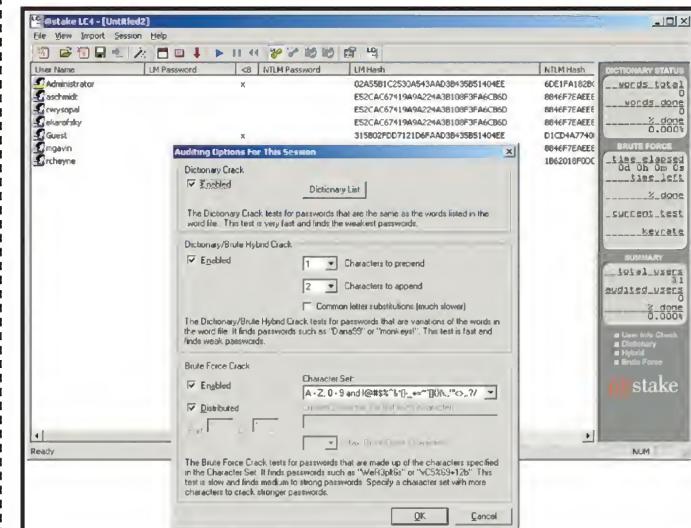
I gave up reviewing the things after the second time a distributor swore up and down that *this* one would work, but it didn't. If you go to the computer shop and see an external box working with a CD writer, buy that box. If you don't, don't.

Return the box you've got. If you told the dealer that you wanted to use it with a CD writer, then you've got an airtight case for a full refund, not just an exchange or store credit.

## i

## H4XX0Ring your own BOXX0R

I've lost my admin password for Windows XP. Is there a backdoor password or something? I don't want to waste my money on computer technicians to fix it for me. Howe



ABOVE: L0ptCrack 4. It hungers for your password hash file.

## o

You need to recover the SAM (Security Account Manager) file and crack it, or just insert your own new password hash into it. Who cares what the admin password was; it can be whatever you like!

Everybody should know how to do this, not because everybody actually needs to crack WinNT/2000/XP password files, but because it teaches you how totally screwed you'll be if someone wants access to your supposedly secure data, and has physical access to your PC.

Oh, and it also shows you how hilariously fast you can crack a lousy password.

There are lots of places where you can read all about this; try ([www.hackinthebox.org/article.php?sid=5721](http://www.hackinthebox.org/article.php?sid=5721)) for instance.

Note: people who just want to be thought of as a dangerous technical bad-arse in the office don't need to bother reading this stuff. Just writing 'XP admin PW cracker' on a floppy disk and leaving it on your desk will do.

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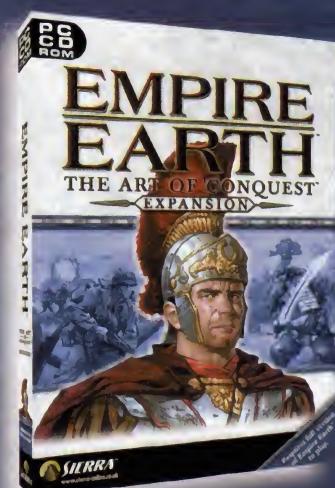


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# SUB ATOMIC

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hand-placed in your letterbox each month. This has obvious advantages, mainly being that each month *Atomic* will come wrapped up, as opposed to naked, being the manner in which most newsagents serve *Atomic*. So subscribe, and give something back to the dolphins.

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# The Uber-Linux box project Pt2

After last month you have a fully functional Linux box and now the inevitable 'wondering what more to do with it' crisis has set in. Ashton Mills has an answer: use it to get your LAN onto the Net, and do it safely, securely and with pretty graphs to boot. He was even kind enough to write an *Atomic* firewall just for your complete peace of mind.

Last month we installed Linux and setup a file server for your Uber-LAN, learning some Linux basics as we went along. This month we're going to go hardcore with the penguin to set up your machine as a rock solid firewalled gateway sharing your Optus or Bigpond connection, boost its performance with a proxy, and sex it up with its own dynamically generated netstats. Welcome to the Uber-wall.

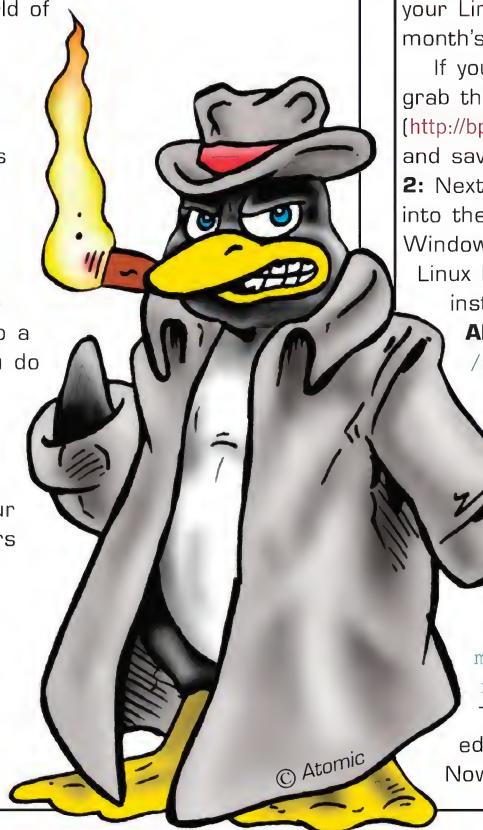
There are all sorts of hardware and software gateway solutions you can buy off the shelf these days for the home or office network. All of them, however, cost cash. Functionally a gateway and firewall is a simple affair, so why fork out money for something you can easily build yourself?

In last month's *Atomic* we showed you how to install Linux, browse your system a little, and setup file sharing for all your Uber-file sharing needs. Now we'll take that same box and give it gateway and firewalling capabilities, throw in a proxy cache to speed up and save your bandwidth, and then setup a throughput graphing system so you know exactly how close to your cap (if you have one, har!) you are at any given time. And all without spending a cent. If this appeals to your lust for bandwidth, that makes two of us, so let's get on and delve into the wondrous world of gateways and firewalls.

## Learning stuff

As mentioned last month there are Linux distributions tailored specifically to be firewalled gateways – such as Smoothwall ([www.smoothwall.com](http://www.smoothwall.com)) and IPCop ([www.ipcop.org](http://www.ipcop.org)). These distributions literally take up a mere 25MB ISO and all you do is chuck the CD in, feed it your local and ISP network stats, hit 'OK' and in an instant you have a box that'll share and secure your Internet connection for years without blinking.

But at *Atomic* we like to build things and, more importantly, learn how they work in the process. We've also got plans for the Uber Linux box that involve more than pushing packets,



such as the file sharing we've already covered last month and the goodies we've got planned for you next month. So grab your fave caffeine laced beverage (caffeine and Linux go hand in hand, of course) and get comfy. It's time to teach the tux new tricks.

Picking up where we left off, the first port of call is hardware. A gateway box needs two network cards installed in order to share your broadband connection, so if you didn't plug-in two network cards when you built the box shut it down now, install a second card, and reboot the machine.

From here on in you can, if you like, hook up a monitor and keyboard as we go through these steps (alternatively you can use a KVM switch if you have one), but it's just as easy to set everything up remotely over the network, so that's how we'll do it in this guide.

## Step one: grab software

**1:** Before you go pulling out your current connection to the Net download the specially prepared official and supremely cool *Atomic* Uber-Firewall from ([www.atomicmpc.com.au/downloads.asp](http://www.atomicmpc.com.au/downloads.asp)). Save the file directly to your Linux box (in /home/storage if you followed last month's guide).

If you're stuck with Telstra Bigpond you'll also need to grab the RedHat RPM of BPALogin at (<http://bpalogin.sourceforge.net/download/bpalogin-2.0-1.i386.rpm>) and save it to the Linux box as well.

**2:** Next grab your Mandrake 8.2 install CDs, plonk CD1 into the Linux box CD-ROM, sit back down at your Windows box, open up a DOS prompt, *telnet* to your Linux box, *su* to root, *mount /mnt/cdrom*, and then install the following programs:

**ADSL users:** *rpm -ivh*

*/mnt/cdrom/M(TAB) /R(TAB) /rp-pppoe (TAB)*

**Cable users:** *rpm -ivh*

*/mnt/cdrom/M(TAB) /R(TAB) /dhcpcd (TAB)*

This will install the PPPoE or DHCP client as appropriate for your connection.

Cable users be sure to install the *dhcpcd* package and not *dhclient*, which is an alternative DHCP client.

**3:** Run *eject /mnt/cdrom*, insert CD2 and type:

*mount /mnt/cdrom*

*rpm -ivh /mnt/cdrom/M(TAB) /R(TAB) /jed\**

This will install an easy to use console-based text editor which we'll be needing soon.

Now we are ready to play!

## Step two: configure the NICs

If you're following on from last month then chances are you're accessing the Linux box over *eth0*, the first network card in your Linux box. It's somewhat accepted practice that *eth0* should represent external connections, such as the Internet, so we're going to stick with convention and connect the cable/ADSL modem to *eth0*, swapping the internal LAN to the second/new NIC in the machine, *eth1*.

**1:** While still logged in as root, run:

`draknet`

Without an X client running on your machine (which we'll cover next month) `draknet` will default to console output, which is all we need.

**2:** Select to 'Configure the connection' followed by 'Use auto detection'. Your network cards will be detected and the appropriate modules loaded.

**3:** If you're on cable just make sure 'LAN connection' is highlighted and click OK. If you use ADSL make sure 'LAN connection' and 'ADSL connection' are highlighted before pressing OK.

**ADSL users:** Select PPPoE when prompted and fill in your login details. Select *eth0* for the 'Internet connection'.

**Cable users:** Simply select 'bootp/dhcp' when prompted for *eth0* details, ignore the IP address.

**4:** When prompted for *eth1* details, type in the IP you used when setting up the Linux box and the address through which you are currently connected. This will most likely be 192.168.1.1 (a good IP for a gateway).

**5:** Enter a DNS server for your ISP when prompted, ignore the settings for gateway and gateway device. *This machine will soon be a gateway itself.*

**Uber note:** If you don't know your DNS addresses, run `ipconfig /all` under Windows while connected to your ISP.

**6:** When prompted to restart the network, select NO. Draknet will automatically update configuration files in `/etc` to start both connections with your chosen settings at bootup.

When you're back at the prompt it's time to shut down your Linux box: `shutdown -h now`

## Step three: changeover

Time to bring your phat pipe to the Net down. Close up any Internet based apps you're using, walk over to your tireless cable/ADSL modem, and *pull the plug*.

**Uber note:** Do not just turn it off, physically remove the power or turn it off at the wall to cycle the modem – some cable modems will lock onto the MAC address of the first network card they see, and will simply refuse to operate properly when plugged into another NIC. If you can't get an IP with DHCP, this is the reason.

Next, swap the RJ45 cable that was in *eth0* to *eth1* before plugging the modem into *eth0*. Power on the modem, let it run through its self-diagnostics, then turn your Linux box back on. If all goes well your PPPoE/DHCP client will grab an IP from your ISP for *eth0*, and you'll be connected to the Net. If there's a problem for whatever reason the PPPoE/DHCP client may take a few minutes to time out before Linux continues to boot, so please be patient.

When your box has booted open up a DOS prompt on your Windows box, `telnet` into the Linux box, `su` to root and run: `ifconfig`

You should see three entries: *eth0* with an IP allocated by your ISP, *eth1* on 192.168.1.1, and the loopback device '*lo*'. If *eth0* didn't come up then your machine could not grab an address from the ISP. See the end of this section for further help on troubleshooting.

For Optus users there's no more configuration required. Bigpond users have one more step they need to complete.

### BPAlogin for Bigpond users

Assuming you saved BPALogin to your shared Samba directory, install it as follows: `rpm -ivh /home/storage/bpa` (TAB)

Now it's time to use Jed, which we installed with some foresight earlier: `jed /etc/bpalogin.conf`

Supply your username and password and modify the other settings if you feel comfortable, but the defaults should suffice. To save in Jed simply Ctrl-F to bring up the File menu and select Save. Note that keymappings aren't properly mapped by Windows telnet, and you may find that keys like 'Delete' work instead of 'Backspace' in Jed. By default BPALogin will be set to start at boot, but you can run it now as follows: `service bpalogin start`

To see if you logged in successfully you can check the general messages logfile with: `cat /var/log/messages`. This can be a rather big file at times, so narrow your search with grep: `cat /var/log/messages |grep bpalogin`.

Before we continue, whether you're on Optus or Bigpond, check you can access the Web in all its glory by pinging a truly awesome site:

`ping -c 5 www.atomicmpc.com.au`

If you can't ping the Net `cat dmesg |more` to ensure the modules for your network cards are being loaded fine. Then check `/etc/sysconfig/network-scripts/ifcfg-eth0` and `ifcfg-eth1` and make sure they correctly list the configuration you set up using `draknet`.

If you can ping but URLs don't resolve, `jed /etc/resolv.conf` and make sure you have the nameservers listed for your ISP.

If it all works like a charm, congratulations, your Linux box is a now a member of the global Internet community!

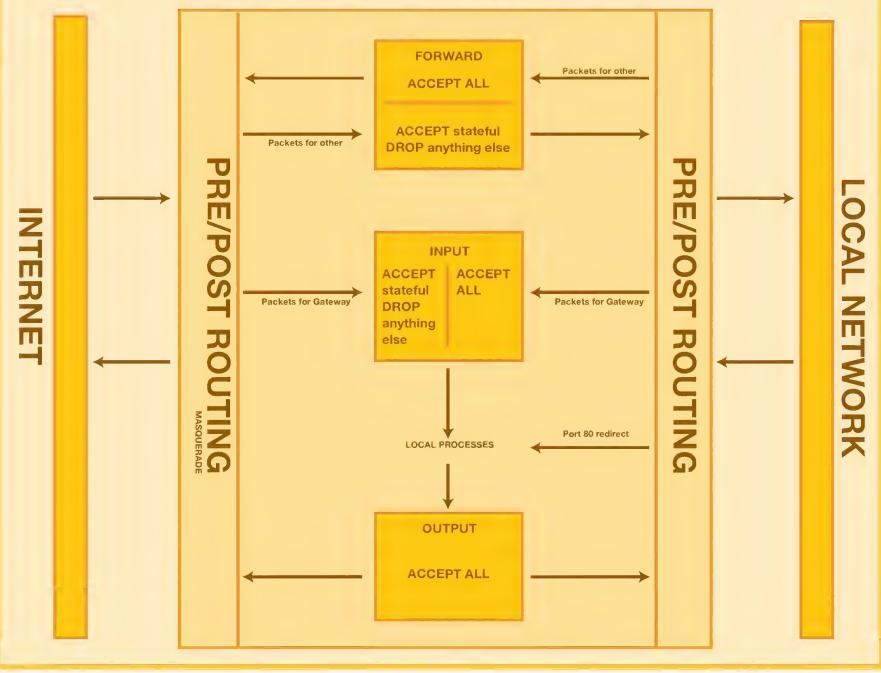
## Step four: firewalls love

Your Linux box is on the Web, all pristine and naked. It's time we gave it a warm firewall to protect it from I337 script kiddies and seemingly semi-competent crackers who could get in through open ports and do naughty things to your box and your network, or use your box as a launching pad to do naughty things to other people. A machine permanently connected to the Net without a firewall is, in itself, a naughty thing to do. There are a plethora of firewall scripts available online (a fine selection can be found at [[www.linuxguruz.org/iptables](http://www.linuxguruz.org/iptables)]), but many are overly complex – often designed for large networks or with specific filtering requirements in mind.

For a home or office gateway box, building your own wall is actually quite simple. And because this is Atomic, that's exactly what we did.

## ATOMICFIREWALL02

### ATOMICFIREWALL



### Banging on the wall

You've got a very spankable Linux gateway and firewall box sharing your phat pipe to the Net. Fulleh, it's time to show off.

Head out on the Web to an online firewall testing service such as (<http://scan.sygate.com>) or ([www.dsreports.com](http://www.dsreports.com)) (make an account to use the full scan, because it's well worth it) and see what results you get.

Alternatively get a Linux buddy to `nmap` port scan your box using its rather comprehensive firewall-banging abilities. Take note however that to be safe, `nmap` will report as open those ports allocated for common services that show up as unknown. If in doubt the ultimate authority is the firewall - if it's logged, it's filtered.

If you `UDP` scan your box, take note that `nmap` doesn't behave in the way you'd expect. If in doubt, read the docs!

Props go to Brad Webb for doing exactly this and putting the *Atomic* firewall through its paces. It's always handy to have a Linux zealot in-house.

### Firewalls 101

To understand how packets move through a gateway and how a firewall weaves its magic we first need to understand the flow of information.

Under Linux it is the kernel itself that manages the flow of packets through a machine, but just *how* it manages to do this is determined by rulesets created with a program called `iptables`.

Every packet that enters the system must pass through at least one set of rules, known as a *chain*, that determines how the packet should be handled – whether it is allowed through, rejected, dropped on the spot, forwarded and so on. By default every firewall configuration consists of at least three chains: INPUT, FORWARD and OUTPUT. The INPUT chain is used to manage packets coming into the system, the FORWARD chain to manipulate the destination of packets not directly addressed to the firewalling box, and the OUTPUT chain to handle outgoing packets. To every packet matching a rule a judgment will be applied, such as ACCEPT, DROP or REDIRECT. If a packet doesn't match any rules it is applied against the default POLICY for a chain.

A firewall, then, is simply a set of rules that restricts or allows the flow of packets through a machine in accordance with the requirements you set out.

So what are our requirements? Well, we want to lock down the system and keep everyone on the Net out of the gateway, but allow machines on the LAN to access the Net. In firewall parlance, this can be summarised as: DROP

all but ACCEPT connections originated by the local network.

The best way to learn is by example, so decompress the atomic-wall.gz file you downloaded earlier from the *Atomic* Website into the /tmp directory and open it up in Jed:

```
unzip /home/storage/atomic-wall.gz -d /tmp
cp /tmp/atomic.firewall /etc
jed /etc/atomic.firewall
```

Looking at the script you'll note it's divided into a number of sections: initialisation, flushing, default policy, the three chains, and NAT.

The initialisation section assigns variables we'll be using such as the network devices and where to find programs like `iptables`. If you're following this guide to the letter you won't have to change anything.

A little further down we set a selection of IP settings via the /proc filesystem, including a setting called 'ip\_forward' which allows the kernel to forward packets – this is the first half of the gateway equation.

After this we call `iptables` to flush the chains in order to start with a clean slate, and then we immediately set the default policy for each chain. For our firewall we set INPUT and FORWARD to DROP, and OUTPUT to ACCEPT.

Now for the fun stuff – the INPUT chain. Bigpond users should uncomment the heartbeat lines to allow the vital Telstra heartbeat packets through.

The two lines following this specify that we want to allow all internal traffic, which is nice, and the line following this is the magic in our firewall:

```
$IPTABLES -A INPUT -i $EXT_IF -m state state ESTABLISHED,RELATED -j ACCEPT
```

This tells the kernel to allow connections to the gateway box from the external interface that have been previously established – otherwise known as *stateful inspection*. A stateful firewall doesn't need to set up port mappings through the firewall for the gateway or client machines, instead the firewall will allow through any packets that are responding to a connection that first originated from the inside trusted network. It's rather like having doors appear only in the moment they are needed, and only if requested by someone inside the house, before vanishing again.

The rest of the INPUT chain drops packets from various dodgy or unnecessary sources before reaching the LOG rule which logs information about packets that were filtered. The quick-of-mind among you may be wondering what the point is of explicitly dropping packets when the default policy is DROP anyway. The answer is simply to reduce logfile clutter – remember the policy is the last stop, applied only after the packet has traversed all the rules in a chain. By dropping them before the LOG rule they never make it far enough to hit the policy and be logged.

In the FORWARD chain we have just two rules: a stateful inspection rule to forward packets outside from established connections onto the client machines, and a companion rule to forward on all packets coming into the gateway from the internal network – in other words these two lines create the pathway for allowing the LAN to use the Net through the firewall.

The OUTPUT chain determines what to do with packets coming out of the gateway box, and remains empty. If it wants to come out of the gateway box it probably has good reason to do so, hence we set the default OUTPUT policy to ACCEPT.

The end of our firewall script is the other half of the gateway equation – the 'ip\_forward' /proc setting allows the kernel to forward packets, but this line in the firewall actually does all the work:

```
$IPTABLES -A POSTROUTING -t nat -o $EXT_IF -j MASQUERADE
```

Masquerading is a form of NAT (Network Address Translation) which allows the gateway box to *masquerade* on behalf of the machines behind it, thereby creating the illusion that all packets originate from the gateway box. This is the nature of connection sharing. It's also the reason why no one with more than half a brain pays extra fees for using more than one box on their broadband connection.

So how does the *Atomic* firewall script perform? According to DSLReports' respected firewall test it achieves a perfect score. To anyone scanning ports they will receive no response, not even a polite 'I'm here but I'm closed'. And because the wall drops ICMP packets, the box isn't even *pingable* from the Net. Yet from the inside client machines can happily use the Web, email, FTP, ICQ, IRC and games. Stateful firewalls *rock*.

**Uber note:** Because the default policy is to drop all packets if you ever want to run a server accessible from the Net you'll need to add an INPUT line that ACCEPTs connections to whatever port the service uses. The format is: -A INPUT -p [protocol] -dport [port] -j ACCEPT. For the full low-down run `man iptables`.

## Running the wall

Starting the firewall is as simple as running the script: `/etc/atomic.firewall`

To see the rules established by the script run `iptables` with the listing switch: `iptables -L`

To see active connections to and from the gateway box run: `netstat -an`. This is handy to see which ports applications use, and what stateful connections are active. Use with just '-a' to resolve IP addresses to hostnames.

Lastly to make sure the firewall is started at every boot we simply add the script to Mandrake's equivalent of the Windows startup folder – the `rc.local` file. Run `jed /etc/rc.local`, scroll down to the bottom of the file, and add `/etc/atomic.firewall`. Save the file and quit.

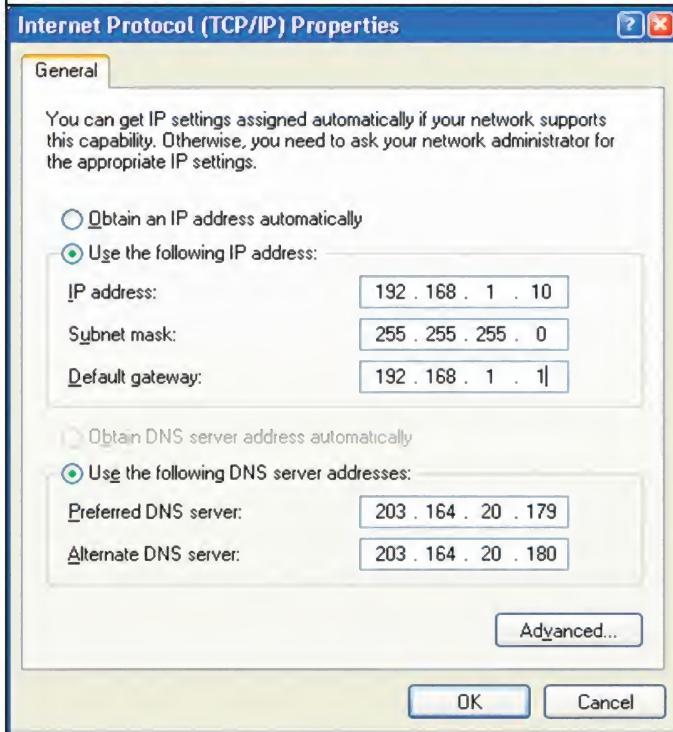
**Uber note:** Don't enable 'iptables' in `drakxservices`, this will conflict with the firewall loading in `rc.local`.

Congratulations, your Linux box is now a fully fledged firewalled gateway!

## Setting up clients

Now you have a gateway you need to point the machines on the LAN to the gateway for all your Internet needs. On the Windows boxen click Start → Control Panel → Network Connections → Local Area Connection → Properties → TCP/IP → Properties and set the 'Default gateway' to 192.168.1.1. Click OK and then make sure you can access the Web in all its glory by surfing, checking email, and logging onto #atomicmpc to boast about your Uber-legendary firewall.

If a URL doesn't resolve remember you still need to tell client machines the DNS addresses of your ISP. These can be filled in on the same dialog as the gateway.



ABOVE: Configuring a Windows client to point to the gateway box

## Step five: the sexiness of Squid

Optus and Bigpond have this crazy notion that broadband isn't, in fact, anything about bandwidth in any form of broadness. The monthly caps seem to imply that all people want to do with broadband is sit there all day idly browsing the Web. Pfft, we can do that at work! Er, on lunch break of course.

So how would you like to stay below the caps by making your bandwidth go further, saving you money on BPA or keeping your pipe phat on Optus, and speed up your browsing all at the same time? Yes, it turns us on too.

Say hello to Squid, the Linux proxy cache. Proxies are simple in nature: cache data locally so that future requests for that same information can be served locally instead of somewhere remotely, like the Web. This has the benefit of decreasing load times in your browser to previously visited sites, and reducing the amount of bandwidth used over your connection. For households with more than one machine sharing the connection, this can be a big bandwidth saver.

You may already be using your ISP's proxy cache if you configured your browser to use it. We're going to set up Squid on the gateway box to be a proxy cache for the local network, but we're going to make it a *transparent* cache so that no fiddling of browsers is required.

If you followed our installation guide last month Squid will already be installed. All we need to do is change a few configuration variables. It's possible to use Webmin to configure Squid, but initially it will be much quicker to edit the configuration file directly.

**1:** Fire up Jed and open `/etc/squid/squid.conf`. This is your classic massive Linux configuration file.  
**2:** Scroll down until you find '# http\_port 3128' under the first '#Default' heading. Squid can be bound to a single IP address, so that's exactly what we'll do to be secure. Uncomment the line and add the IP address of the gateway as follows:

```
# Default
http_port 192.168.1.1:3128
```

**3:** Page down or use Jed's search feature until you find 'cache\_dir' under another '#Default' heading. Uncomment the line and adjust the first value to the amount of disk space you want to allocate to the cache. Around 500MB is probably plenty, but if you can afford it give the cache one gig like so:

```
cache_dir ufs /var/spool/squid 1024 16 256
```

**4:** Now we have to enable access for the local network. Scroll down or search until you come to the 'ACCESS CONTROLS' section, and then scroll down a little further until you come to 'Recommended minimum configuration'. There will be a list of settings, at the end of it add:

```
acl mynetwork src 192.168.1.0/255.255.255.0
http_access allow mynetwork
```

**5:** Squid is now ready to be started, but to make it a transparent cache there are a few more settings we need to tweak. Scroll down or search until you come to the heading 'HTTPD ACCELERATOR OPTIONS', uncomment 'httpd\_accel\_port 80' and add 'httpd\_accel\_host virtual' so it looks like:

```
httpd_accel_port 80
httpd_accel_host virtual
```

**6:** Scroll down further to 'http\_accel\_with\_proxy', uncomment it and enable it so it reads: `http_accel_with_proxy on`

**7:** Just a little below this uncomment and enable the 'httpd\_accel\_uses\_host\_header' line:  
`httpd_accel_uses_host_header on`  
**8:** Save the file and quit Jed, then run `drakxservices`. Scroll down to 'squid', enable it, and hit OK. Squid will now be started by default when the machine boots.

We have just one more change to make. Fire up `jed /etc/atomic.firewall` and page down down to the bottom of the script. Uncomment the `iptables` line that will forward port 80 (HTTP) requests to Squid:

```
$IPTABLES -t nat -A PREROUTING -i $INT_IF -p
tcp dport 80 -j REDIRECT to-port 3128
```

Save the file, re-initialise the firewall and start Squid by running:

```
/etc/atomic.firewall
service squid start
```

Et voila, you now have a transparent proxy caching firewalled gateway. And you didn't even have to reboot! Try doing the same on certain *other* operating systems and see how far it gets you.

If you want to see how Squid is performing:  
`cp /usr/lib/squid/cachemgr.cgi /var/www/cgi-bin`. Then, after you've followed step six and have Apache running, point your browser to (<http://192.168.1.1/cgi-bin/cachemgr.cgi>) to view everything you ever wanted to know about your Squid proxy setup.

## Step six: the magic of MRTG

We have one more nifty feature for your Uber-Linux box of joy this month – locally generated netstats, plotted for your perusal and served up on a Web page. Dang, we are so good to you.

To accomplish this feat we'll make use of an excellent package known as MRTG, the Multi Router Traffic Grapher. MRTG is designed to graph averages of just about any data you feed it – Web hits, CPU load, temperatures, alien invasions or, with a bit of fiddling and our own script to sample the data, throughput on a broadband gateway. This is all but a necessity given the Optus and Bigpond usage meters are sorely lacking.

MRTG normally reads data via SNMP from big fat routers or beefy servers. We're not running an SNMP server so we'll need to get our data another way. Additionally, in order to get MRTG to plot totals that reset on a monthly basis to match ISP monthly caps, we'll need to keep a log that can be automatically reset from month to month.

Behold, in the `atomic-wall.gz` archive you'll find the `Atomic monthlystats` script written especially for this purpose. The script works by directly reading throughput stats of the network card from `/proc` (the wonders of which we covered last month), and passing them onto MRTG formatted as megabytes.

The script updates its own log file in `/var/log` each time it is called, and at the end of the month creates a separate logfile to tally total throughput by month. It's even indexed by year!

Between MRTG displaying a history of your throughput on a daily, weekly, monthly and yearly basis and the totals generated in the `monthlystats` logfile you'll know exactly how much you're using, how much you've used, and when. For an Uber-box serving a number of flatmates this is an ideal method to keep an eye on the total bandwidth the household is using, and is far more accurate than the usage meters supplied by Optus and Bigpond. Unfortunately, if you try to use MRTG results to prove a billing error, helpdesk will just laugh at you.

## Setting it up

- 1:** Start by grabbing the MRTG package. Surf from your Windows box to ([www.rpmfind.net](http://www.rpmfind.net)) and type in 'mrtg' for the search. Scroll down and grab the 2.9.20 version 'Falsehope' package as this is the latest MRTG that'll work well with Mandrake 8.2 without requiring the installation of extra packages. Saving it to the Linux box, install it with:  

```
rpm -ivh /home/storage/mrtg (TAB)
```
- 2:** The atomic-wall.gz archive includes a tailor-made MRTG configuration file and the *Atomic monthlystats* script designed to work with MRTG. Assuming you unzipped atomic-wall.gz to /tmp earlier:

```
cp /tmp/mrtg.cfg /etc/mrtg
cp /tmp/monthlystats /usr/bin
```

- 3:** Initialise MRTG and build the HTML index page:

```
mrtg /etc/mrtg/mrtg.cfg
indexmaker /etc/mrtg/mrtg.cfg >
/var/www/html/mrtg/index.html
```

## Tracking cracking

How do you know if your wall is doing its job? Check the syslog:

```
tail -30 /var/log/syslog
```

Packets captured by the wall will show up something like this:

```
Aug 13 03:54:15 Mandrake kernel: |iptables
IN=eth0 OUT=
MAC=00:00:e8:4a:ba:ca:00:06:2a:c9:60:a8:08:00
SRC=209.191.132.40 DST=211.28.44.XXX LEN=60
TOS=0x00 PREC=0x00 TTL=48 ID=0 DF PROTO=TCP
SPT=59642 DPT=952 WINDOW=5840 RES=0x00 CWR ECE
SYN URGP=0
```

Mmm geeky stuff; let's take a look at it: you have the NIC, its MAC address, the source IP, the destination IP (the gateway box) and a little further on the protocol (TCP in the example above), the source port and the destination port. Note that not everything you see logged will be a malicious attempt at gaining entry to your machine, mostly it'll be Internet 'noise'. But you can check by tracing the source.

First run `nslookup` while logged in as root to see if the source IP has a registered domain name. If this doesn't prove helpful try using `traceroute` to find the general path the packet took to arrive – the name of some of the routers will at least give you the source country and ISP. It's also helpful to look at the source and destination ports to see what the packet was trying to accomplish. If you don't know what the port does, run `grep [port] /etc/services` to see if it's listed as a known service.

Note that you may need to first install the `traceroute` and `bind-utils` packages from the first Mandrake CD to get access to these tools.

**4:** The MRTG RPM automatically updated the system's `crontab` file to run MRTG every five minutes. We'll change this to a more reasonable interval of ten minutes, to which the configuration file has been tuned. Run `jed /etc/crontab` and change the '5' to a '10' for MRTG:  

```
0-59/10 * * * * root /usr/bin/mrtg
/etc/mrtg/mrtg.cfg
```

**5:** All that's left to do is start the Apache Web server. Fire up `drakxservices` again and enable 'httpd' so it'll start at bootup. Click OK and then start the Apache server with: `service httpd start`.

Now go and suck down the latest *Lord Of The Rings* trailer and check your stats in ten minutes' time by pointing a browser from any machine on the network to (<http://192.168.1.1/mrtg>).

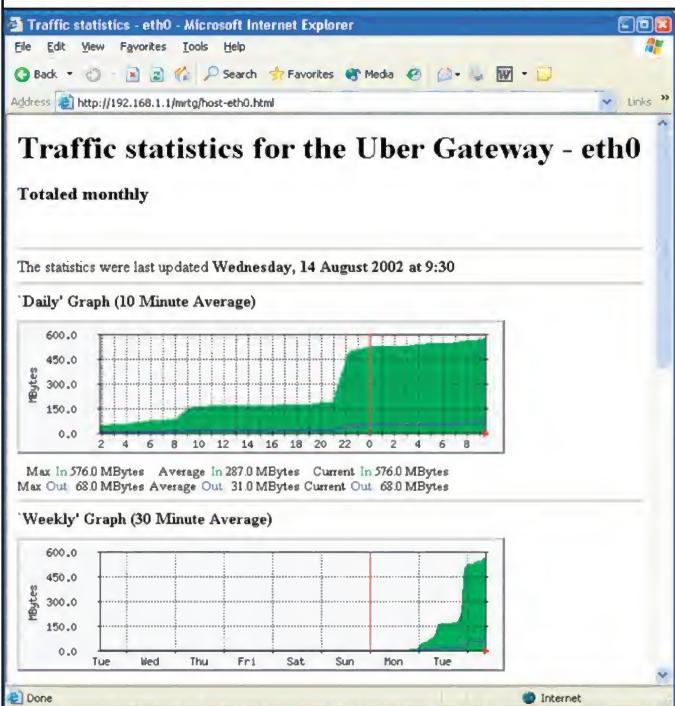
You'll note we included an uptime graph as well, so you'll have a history of your machine's uptime over the year. Click on the graphs to get a detailed breakdown.

If you want to get handy with Jed again you can edit `/etc/mrtg/mrtg.cfg` and tailor the HTML titles displayed to match your machine.

When the month ticks over you'll find a log file called `eth0-Monthly-Totals.log` in `/var/log` which will ongoingly list your total throughput month by month.

If you're an HTML guru you could edit the `mrtg.cfg` file to load this at the bottom of the summary page.

For detailed information on how the script works, give it a browse.



ABOVE: Keep a leash on your leeching with the *Atomic monthlystats* script and the graphing powers of MRTG!

Next month we delve into remote desktops, distributed computing, game serving and more Linux goodness than you could poke a penguin at.

# HARDLY TRIVIAL PURSUITS

## Altec Lansing 80321 console speakers

Much like the Canterbury Bankstown Bulldogs, the world of console gaming is constantly undergoing an unsteady revolution. Recently, Microsoft, maker of the world famous 'Windows' operating system, entered the game with its oddly named 'Xbox' gaming console. Destined to be the centerpiece of the living room digital home globally networked entertainment system, the Xbox requires speakers in order to acoustically reproduce the 'bleeps' modern computer games make. In order to facilitate the maximisation of the Xbox Xperience, Altec Lansing has produced the 80321 speakers. Innovision ([www.innovision.com.au](http://www.innovision.com.au)) let us give them away.

**Q:** What does the PS2 slogan 'The third place' mean?



## Iwill P4GS mobo + FI panel

The future of motherboards is here. Just below this text. There it is! The P4GS from Iwill – a company named, no doubt, with the aim of conveying unrelenting determination, in this case, unrelenting determination to be a motherboard – has got all the good new stuff built-in. It's got Serial ATA support! Or, if you don't have a Serial ATA drive, because they don't exist yet, it's got ATA133 onboard. Groovy. USB 2.0 is there too, but that's a bit standard these days so we won't rave about it. The FI panel has SD and Memory Stick readers and USB 2.0 ports. If you're running a P4, or want to move up to one, this mobo will serve you as well as a French maid laying out Toad in the Hole.

**Q:** What aromatic substance is found in the stomach and intestines of the sperm whale?



## Tyan Tachyon G9000

If the RADEON 9700 was a grizzly bear standing on a rock on top of a waterfall catching salmon that had endured enormous struggle in a futile attempt to drop a few eggs on the pebbles so some male salmon can swim by and squirt all over them, then surely the RADEON 9000 would be the wily Native American fisherman, hiding nearby in the woods to catch any wounded salmon that somehow escaped the deathlike vice of the grizzly bear's horrific jaws of hell. Tyan, being the Prairie Dog of the motherboard world, has moved into the river of video cards with its Tachyon G9000, which is like a RADEON, but with a different name. It sounds faster, even though it isn't. But who cares if you win!

**Q:** What should you do if you're attacked by a Grizzly Bear?



## The Sum of All Fears

Tom Clancy's eerily visionary account of the war we had to have, but never did, *Red Storm Rising*, stands alone as the most accurate explanation yet of why Communism sucks and Yankee Imperialism is the One True Way. While Nixon and Kissenger's grovelling to the Chinese led indirectly to the Tibetan Panchen Lama's kidnapping, Tom Clancy was the stable stone of a generation of anti-pinko European-theatre conventional war enthusiasts. Meanwhile, if Harrison Ford's Jack Ryan and Alec Baldwin's Jack Ryan had a fight, Han Solo would demolish the 'man' formerly known as Mr Bassinger. The end result of this mess is that we have six copies of *The Sum of all Fears* to give away.

**Q:** What form of propulsion drove Markus Ramius' vessel?



Email entries to [win@atomicmpc.com.au](mailto:win@atomicmpc.com.au) or post them to: *Atomic*, PO Box 275, Beaconsfield NSW 2014. Please send a separate entry for each competition. Please ensure the competition name is the subject of the email, or is displayed clearly on the front of the envelope. The closing date for entries is 18 October 2002. Winners will be announced in *Atomic* 23.

*Atomic* 20 winners: Xoxide CPU Tacho: Q. How many times has Evel Knievel broken bones? A. Evel Knievel has broken his bones 35 times. M. Jeffery, Glenbrook NSW. Spider-Man and Punisher grills: Q. What font is used in most comic strips? A. ComicSans. D. Gerden, Glen Iris VIC; M. Laye, Wheeler Heights NSW. Neverwinter Nights plus exclusive jacket worth \$300: Q. What monster has the most hit dice in Dungeon and Dragons? A. Tarrasque. K. Bond, Henley Beach SA; C. Huelsebusch, Donvale VIC; D. Gabriel, Keysborough VIC; D. Skipworth, Salisbury North SA; G. Gully, Keith SA. Lian Li mouse pads: Q. Which mouse fought at the great Battle of Beruna? A. Reepicheep. C. Fulford, Woori Yallock VIC; M. Hill, Greewith SA; L. Ewart, Kirwan QLD; D. Howe, Stretton QLD; T. Tai, Fairfield NSW; T. McLoughlin, Ferntree Gully VIC; L. Day, Ryde NSW; D. Bjuna, Bibra Lake WA; D. McConachie, Palmerston North NZ; A. Mujaj, Bridgeman Downs QLD; S. Regam, Buddina QLD; E. Choa, Auburn NSW; M. Gordon, Epping NSW; M. Carlaw, Toowoomba QLD; D. Brine, Underwood QLD.

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# Sharp Scripting

Once again our letters email inbox ([post@atomicmpc.com.au](mailto:post@atomicmpc.com.au)) was so chockers that the *Atomic* mail server decided to pack it in and take off to Hawaii for some well earned R and R. After coaxing it back to the *Atomic* catacombs with promises of lovely RAM to fill its one remaining memory slot, we managed to extract the following chunks of wisdom, humour, and plain old nuttiness. This time around the writers of POTM and LOTM will both be gaming the night away on a new Logitech Dual Optical Mouse, courtesy of the mousey folk at Logitech ([www.logitech.com](http://www.logitech.com)).



## LOTM More Linux lovin'

Your new project column on page 92 of *Atomic 20* is a great idea and full of beans, but like anyone too full of beans, there's a bit of a foul cloud brewing . . .

Linux (and I do use Mandrake 8.2) can be a bit of a headache and a time consuming, beer swilling aggravation for those who aren't used to its, ahem, finer points. A few tips for those who are keen to spend the time to build this new Linux box and not get turned off by hiccups or failed attempts.

- **Backup, backup, backup.** 'I don't need this anymore. . .' and 'Stuff it, let's give this a whirl' are not the appropriate utterances to be heard when breaking open the new MAN8.2 (or MAN9.0Beta) ISOs and thumping the light dimming power switch. You'd be amazed how much you miss a working operating system of \_any\_ type.
- **SOTA hardware is not always best.** Generally speaking (and all generalisations are dangerous, including this one) people don't make drivers for Linux. You need to check the supported hardware databases for a distribution before attempting to blow away your old Billy Boy partition of joy and tenderness and going to the love filled valley of Linux. Anyone with a Kyro chipset-based video card would be well advised to read the fine print. Experience speaks.
- Ashton speaks truth. Linux is not Windows and Windows is not Linux. RTFM. Do not expect to 'muddle it out' and 'she'll be right'. There are many little files with many little configs holding many little secrets. 'I don't need /etc/lilo.conf. Hell I'm using GRUB.' <POW> 'Hmm, now why didn't I make a boot disk. . .'
- If you want to make a Linux firewall, I suggest using Mandrake 7.2 SNF. This is a Web-administrated, brilliant, free, free, free server that will do wonders to your home security. Anyone with half a brain can install it and anyone with a bit of network knowledge can secure it above and beyond the default settings and menu choices. (Brilliant!)
- If you want to make a file serving, print serving, game hosting box, then I suspect the instructions put to page by Ashton will instead be the mother of all servers. Do you have a firewall? People like to find servers on the Net to use for their own purposes. People like Linux. Linux is good. People are bad. A lot of people know very little about Linux and don't make the time to secure their servers. A secure server is a happy server. An unsecured server could mean a whopper of an ADSL bill. Be happy. 'Obey my dog!' Ah, well there you go: a few pointers. I'm off.

**NO CARRIER**

**Uncle Jol**

## POTM: I think, therefore I am...I think.

If you feel like delving into some hardcore philosophy strap-on action, take a peek at Nicher's lengthy thread at [www.atomicmpc.com.au/forum.asp?cat=ge&top=61002](http://www.atomicmpc.com.au/forum.asp?cat=ge&top=61002). Don't forget to use the mind lube before you partake, else you're sure to get sore after only a couple of thrusts. The thread is a tad lengthy to post in its entirety but the general gist is about Descartes' famous 'I think, therefore I am' concept. We think. . .

## Head swell time

Just wanted to congratulate you and the entire crew for doing such a fantastic job on *Atomic*. All magazines evolve, some make it and many don't. While it's one thing to generalise on the evolution of a magazine, I think your team is doing something just a little different. I say different because as you well know you focus on a rather specialised viewpoint of the PC community. I see it as a credit to you all that each issue is always a highly enjoyable and informative read.

So in the end, all I'm really trying to say is this: You know *Atomic* is the best magazine around because your readers tell you so. I see it often on the forums, and while there are always the critics, everything is subjective and putting things under the microscope can sometimes help, especially as you all seem to listen and take critique on board (from what I've seen, thus far). So, keep up all the hard work and continue reaping the rewards, it's well deserved. *Atomic* has certainly been a long time coming.

Kendal McGuire

## More than just a mag

Just thought I'd write to tell you what a great multi-purpose mag you have. I buy it every month on the day it's released. Read it that night and then use it as a mouse pad until the next one is released. It's GREAT! I have your mag on hand for quick access in emergencies and I have a new informative, good looking, mouse pad every month.

Thanks *Atomic*!

Lisa

## Frames per second facts

Firstly, I love your mag – absolutely amazing stuff. Secondly, I'm not disagreeing with you about frame counts in games or graphics rendering, of course 24fps is noticeably different from 50 or 60fps, but Australian TV (and all other PAL or SECAM broadcasting regions) use 25 frames per second. This is an obvious mistake of course. Less obvious however is that NTSC systems actually use 29.97 fps. Not 30 fps.

How right you were about motion blur accounting for the smoothness of 24, 25 or 30fps video/film. Of course you can also further this point with the fact that video sources use two fields for every frame, so in fact there are 50 fields of vision for every second of video in PAL. If you were to examine footage of a man walking left to right on a professional tape deck or editing suite you can see that each field (upper and lower or first and second) that makes up a single frame is minutely, and progressively, different. So if you were to isolate that frame, loop it for a few minutes, then play it back, the result would jitter like River Phoenix in the Viper Room. But of course this only occurs with a video recorded source, not film that only exposes a frame at a time, which is why film (24, 25 or 30 fps) is so very different looking from video. Watch video footage and it has a sheen and smoothness that is not just due to film's lovely graininess or the inferior video camera's CCDs capturing luminance, chroma etc. but mostly because of these two fields.

I've edited television commercials where they are partly shot in video (3-CCD DV Handycams) and super-16mm film. When cut together the eye sees the difference these two fields make in motion smoothness, which is why to match the video to the film in post-production we duplicate the upper field of the video source in order to make it little more steppy ie. filmic. Have you ever seen footage from a Handycam with 'film mode' enabled? It is steppy. (Too steppy actually.) The camera in that mode fakes a duped field mode; it's still 25 frames per second, but only 25 fields per second, just like 25fps film.

Vaughan Smith

## Bleeding eyeballs are fun!

I thought Bennett's article on frames per second was very good and the Penstarsys story he referred to was interesting. It seems 3dfx was right, and

way ahead of its time.

Late last year I had a bit of a stress problem and bled into my eyeball. Imagine first of all having a see-through 8-ball about three feet in front of your nose no matter which way you face. Then, when the bleeding stops, a slight 'wrinkle' in the back of your retina. And you thought TNT cards produced jaggies! The eye doctor said 'Sorry – get used to it!' and then proceeded to take flash photos INSIDE my eye! I have one of the photos and it's pretty cool really. This was the tears bit, 12 months later, no jaggies and no 8-ball. I think my story moral is the same as yours.

Pedro The Swift

*Erm . . . OK Pedro. It's time for your pill now.*

## Tightwad case mod

I know there are some cheap people out there. No, you don't need to put your hand up, you know who you are. You're probably just reading this in the newsagency too aren't you! If you are one of these people and you are looking for a cheap case mod then Contact [book cover] is for you. There are a wide variety of styles available, from wood, stone, metal and, my favourite, animal skins. I did this to my case, which gave a nice leopard skin look for \$3.50 and a bit of black marker helped to emphasise those areas that needed it (power and reset button). So come on you cheap people, if you can't afford the cost of fuel to get to the shop,

walk/run/ride/fly (?) – just get out there and make something of your case. It needs it!

run\_to\_the\_max  
Murray Lake

## The Joy of Linux

I have tried Linux a few times, and had two hiccups that prevented me going further. The first was networking to a Windows machine, which I look forward to reading about in future issues. The second was making the installation useful. I tried to install WordPerfect for Linux using the directions that came with it, and it wouldn't work. ie: gunzip <filename>; tar -xvf <filename> worked, but ./runme didn't. Is there any chance someone understands this, can help, and can include suggestions in the Linux section?

BTW: I noticed you didn't include Priest in your list of employment options in your survey – it doesn't really fit any other category.

Peter

*The mighty Ashton has been informed of your request, so keep those eyes peeled in a future issue of Atomic.*

## See the light

Here are a few ideas regarding Dan Rutter's article on case lighting. Lumiled Luxeon stars also come in a five watt model (More power! What more can I say?). Some potentiometers come with a switch built into them so the pot can be a combined switch and dimmer (everyone seems to hate toggle switches on their computers so here is a solution). The only retailer that I know of that sells pots with a switch is Dick Smith Electronics. The only model that it sells (cat no.R6888) is one Megohm, which will not give you much area for adjustment so you will have to hook it up in parallel with another one Megohm resistor. This will reduce the maximum resistance to 500 ohms.

Another way is to use a power transistor with the pot. Depending on the current rating, this would allow you to power as many LEDs as you wanted or you could use an LM317 voltage regulator configured as a current regulator. This would mean rock solid current limiting no matter what the voltage. That's all for now.

Patrick Herd  
AKA The mad scientist

## FireWire Ownz USB2.0

I saw your review of the Creative Nomad Jukebox 3 MP3 player in your August issue, where you wonder why it uses a FireWire interface rather than USB 2.0. The problem is that USB (whether 1.1 or 2.0) doesn't supply enough power to charge the kind of battery you need to run a suitable hard drive. Toshiba has brought out just such a player, using a USB 2.0 interface but it requires a separate AC-powered cradle to charge the battery. Not only that, but I have seen reports elsewhere that, in real-world tests, USB 2.0 devices seem incapable of reaching anywhere near FireWire speeds.

Could have something to do with the fact that a single USB 2.0 device connection is restricted to a maximum speed of 192Mb/s. By the way, while reading your review of the plain beige AOpen H600A case on page 59 – in which you said 'could be the perfect base for your next case modding project' – a phrase occurred to me for describing this kind of item. How about calling it 'modder fodder'? Lawrence D'Oliveiro

# Compatibility matters

Nine out of ten people don't know the difference between RDRAM and DDRRAM. I came to this conclusion after wandering around the Malvern Swap Meet, asking retailers if they sold PC1066 RDRAM.

Most of them just waved at the pricelist for DDR; some of them tried to tell me I had the letters mixed up; and one Indian chap said 'Oh yes, very hardy'.

I bought a mousepad from him out of pity, knowing he'd be well and truly shafted by the end of the day (swap-meeters hit about an 8.5 on the ruthless scale, up there with lawyers and Foxtel salesmen).

Of the salespeople that *did* know about RDRAM, I heard the same answer as when I try to order crispy skin duck with no skin: 'special order'.

That meant at least two pathetic weeks of RAM-lessness and two weeks of jibes from the guys (they were calling it 'the Alzheimer's box' cause it had no memory at all).

Aside from the Abdominator 2000, my PC had become the most expensive paperweight I owned.

Like a bell in the distance, I remembered the words of a very wise old man: 'Buy computer parts that have been around for six months,' he told me sternly, 'That way, you avoid driver and compatibility issues.'

Mind you, that guy had also told me to 'buy expired milk, because it's cheaper and you can strain the lumps for yoghurt'. Just goes to prove that cheap old men can sometimes make a lot of sense, despite their rancid breaths.

Suffice to say the RDRAM eventually arrived and the bank kindly approved the second mortgage, so all was well.

To celebrate I immediately went out and bought Neverwinter Nights and some frilly lingerie.

The lingerie was for 'she who demands attention' as a bribe for a few extra hours of computer time. Fortunately the bribe worked, 'cause I discovered a whole other bucket of curdles when the game loaded.

Probably the last message you expect to see after buying a Ti4400 video card is 'Direct 3D card not detected'. For a moment I wondered if NVIDIA had pulled a funny (I pictured all these guys in lab coats standing around a GeForce chipset, pointing and laughing hysterically). Then, like a Silicon Valley paycheque, reality dropped like a stone: more compatibility problems. That wise old man was looking like a sage.

The solution came from a random posting on a newsgroup – it turns out that you should disable the Direct 3D drivers with the diagnostic tools, then

enable them again. Simple as that.

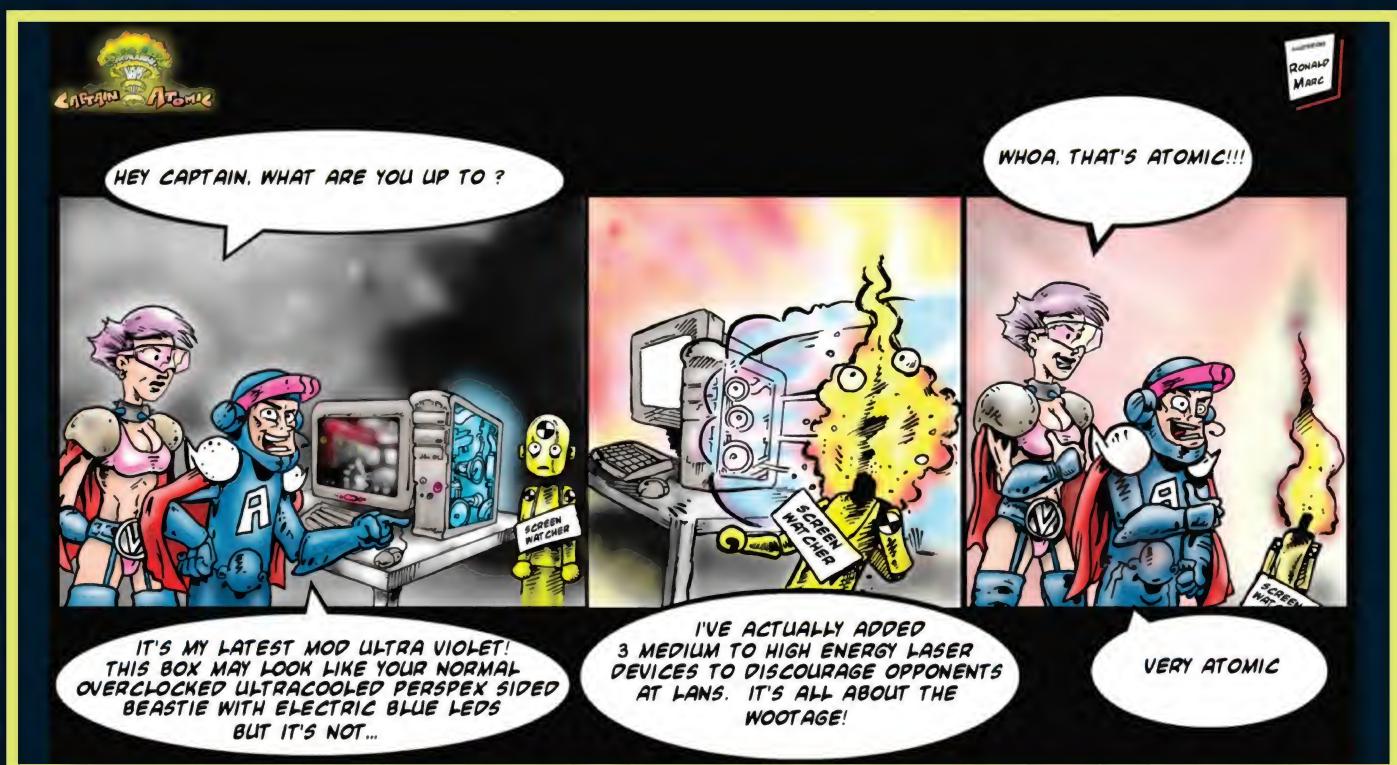
Don't ask me how someone would know that – obviously these guys are aliens or mutation experiments. As they say, two heads are better than one.

Long story short, I got to play 'Neverwinter Nights'. Great game: full D&D 3rd edition rules, excellent character generation, and a bunch of character voices that sound like Christmas drinks in the English House of Commons. And humour! I can't remember the last time I laughed so much at a dwarf in black leather (again with the memory problems).

Anyway, there's a moral to this story: don't always go for the very latest hardware, unless you're single, own a computer store, or your mum works in the underwear department at David Jones. It can be hard to resist all those pretty ads, but just think: if you could play your new game straight away, or you had to sit with a \$3000 cup holder for two weeks, which would you choose? Trust me, next time I attempt an upgrade I'm pulling out my *Atomic* mags from last year and laughing at Ben's hairstyle. After that, I'm checking out the reviews.

It's like I tell 'she who owns a lot of undies': it's not how old but how compatible you are that matters.

John Simpson



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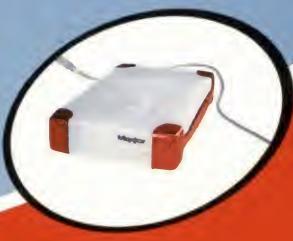
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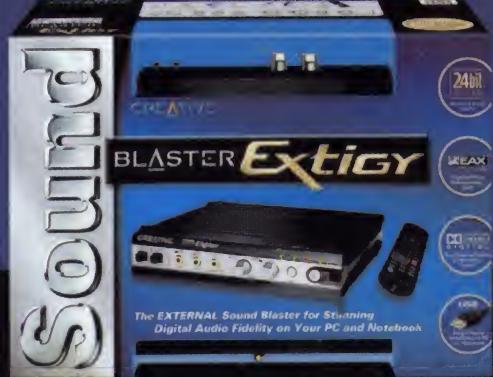
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